## *Report of the Third Sub-Committee on the Fever Hospital and Municipal Improvements.*

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The third Sub-Committee of the Fever Hospital beg to report to the General Committee as follows

After publication to the Native and European Communities, of the urgent necessity existing for the establishment of the proposed institution of relief to the indigent natives suffering from the diseases incident to the climate, separate subscription books were circulated largely amongst the Natives, in the first instance, and then amongst the European residents

From the Natives generally we regret to state, that our expectations have been greatly disappointed, and the more we would call observation to this fact, the more imperative do we feel it to be our duty to bring forward the names of those native gentlemen to whose munificence we are so much indebted They are as follows,—

| | |
|---|---|
| The Rajah of Burdwan, ... .... ................. ...... Rs | 7000 |
| The Rajah of Bettiah, .... ... . .............. ...... ... . | 1000 |
| Rajah Neetunjeet Singh, .. .. ... .... .. . .... .... | 1500 |
| Baboo Dwarkanauth Tagore, .. . ...................... | 5000 |
| Rustomjee Cowasjee, Esq ........................ ........... | 3000 |
| Baboo Rajchunder Doss, ..... ........ . ............... | 2000 |
| Baboo Radhamadeb Bunerjee .. .. ...... ........... | 2000 |
| Baboo Mothoornauth Mullick .. ... .. .. ... . .... . | 2000 |
| Baboo Prosunno Coomar Tagore, .. . ........................ | 1000 |
| Baboo Madub Dutt, ..... .......... .......... .. . .. .. | 1000 |
| Baboos Cony Lall Tagore and Gopaul Lall Tagore, ...., ..... | 1000 |
| Newab of Moorshedabad, ........... .... . . . ............ | 500 |
| Rajah Moodnarain Singh, ..... ........... . ................ | 500 |
| Rajhhon Bahadurkhan, ..... ......... ....... .. ...... | 500 |
| Shaik Abdoolah, Patnah, ... .. . ........ .................. | 500 |
| Baboo Ramkomul Sen, ... .. ..... . . ........ .... ..... | 200 |

From the Native and European inhabitants we find the total amount subscribed to be Company's Rupees 47,723-7 5

Having laid before the general committee, statement of the amount of existing assets, we next proceed to mention briefly the reasons why we consider that, for the maintenance of the proposed institution, we would look for support to the Government.

1st. We find that from an early period of the history of this city, institutions for the moral and intellectual improvement of the natives have been established solely at the charge of Government, and that in addition to assignments, out of the public revenue, of large sums for their annual support, grants of land for building were likewise made. We here allude, amongst others, to the Government Mahomedan College and the Sanscrit College, to the latter of which a lack and twenty thousand rupees were allotted by Government for the cost of building, and a lack and forty thousand for the the former.

2nd We cannot but consider that under a Government constituted as that of India, an institution such as the proposed one, is equally deserving its support with these above mentioned, seeing that as yet, the native land-owners and merchants are not in general sufficiently enlightened to come forward, as in most European countries, in aid of their poorer fellow subjects.*

We think moreover, that these feelings of charity will best be excited in the native mind by the humane example of the Government, seconded, as in the present instance, by the praiseworthy conduct of individuals such as the above named subscribers to the proposed institution.

3rd. We are happy to adduce in support of our opinion, that of a late distinguished member of the Government, Mr. Dowdswell, who declared that "he did not know that the public revenue could be applied to a better purpose than that of saving the lives of those who pay it."

The interest taken by the Marquess of Hastings in the improvement of this city and its institutions, that taken by Lord William Bentinck, and the sentiments already expressed by the present enlightened head of the Government of India, make us look forward with high expectations in furtherance of the present charitable design.

Having briefly noticed the financial prospects before us, we beg in accordance with the resolution of the 13th July 1836, requiring that we should "conduct all measures connected with the proposed Fever Hospital, &c. &c.", to submit to the general committee our observations, more in detail, on some of the professional questions connected with the subject, and more especially of the relative advantages of hospitals and dispensaries,—a subject the discussion of which, we think with Dr. Stewart, "is greatly to be regretted, as tending to divert attention from the grand object to one of second importance", but, as it has been largely entered into in evidences before the committee, and elsewhere, we conceive we should be wanting were we to pass it over lightly.

We propose therefore to detail the evidences adduced before the committee, in their orders of date, and as nearly as possibly in the words of the respective witnesses, only abbreviating them.

* In Ireland we find that both Hospitals and Dispensaries are supported by Government.

Mr. Nicolson considers that for every purpose of relief in acute disease, an hospital has an incomparable advantage over any number of dispensaries, but he does not oppose the establishment of dispensaries, in aid of an hospital, on the contrary he advocates their establishment in several parts of the town, but he would limit them strictly to their proper uses. S. Nicolson, Esq. Dec. 1836.

Mr. Nicolson, says that the majority of applicants at the present dispensaries are of the very poorer classes,—persons who are half-fed and half-clothed, and who when seized with acute disease may continue indeed to apply once or twice for relief; but as these diseases advance, and their strength fails, these poor people are left inevitably to perish from disease and starvation united. Mr Nicolson adds that it is for the reception of this very numerous class of the inhabitants of the town and suburbs that an hospital is so urgently required, and from the want of it many thousand lives are sacrificed annually.

Mr. Nicolson considers that dispensaries might be established on a cheaper plan than those now in existence, and, that when well regulated, they might be rendered eminently serviceable by causing all applicants suffering from acute disease to be removed to the Central Hospital, there to remain till cured. An Hospital such as that contemplated is believed by Mr. Nicolson to be infinitely more efficient, more really useful, and more in accordance with the demands of Calcutta, in its present unprovided state as regards the sick poor, than the addition of a few beds to any number of dispensaries; moreover he thinks the cost of such an institution would little, if at all, exceed that of a number of dispensaries with small infirmaries; in other words, that for all the purposes stated, one large central hospital, well provided, would meet the pressing necessities of the sick poor better than any number of dispensaries "with a few beds to each."

For concentrating the earliest information, watching the approach of epidemics and providing means of general relief during their prevalence, Mr. Nicolson considers an hospital the most efficient. Lastly, he does not think that the proposed institution ought to have any connection with the present Native Surgical Hospital.

On another occasion, and in reference to the question of the best school of practical instruction for the students of the new Medical College, we have Mr. Nicolson stating that, until a Native General Hospital is established, the important end for the attainment of which the College was instituted will remain in a great measure unaccomplished. S Nicolson, Esq. April 28th 1837.

All the instruction that can be communicated to the most diligent and attentive student in a College can never qualify him to practice his profession, either Medical or Surgical, with credit to himself or safety to his patient without the practical knowledge and experience of disease, which can only be attained by patient study and observation at the bedside in an Hospital. Dispensaries offer no opportunities for the study of the diseases of India.

Mr. Martin states that the committee stands pledged to the subscribers and to the public to establish *an Hospital* for the accommodation and cure of persons labouring under the more prevalent acute diseases of the place. J R. Martin, Esq December 17th 1836 and 20th April 1837

2d. That the Governors of the Native Hospital stand likewise pledged to the public " not to encroach upon the constitution of the Native Hospital, but that the proposed institution is to be essentially a separate one, both as regards its funds and the rules by which they are to be administered." On the relative advantages of Hospitals and Dispensaries he states—

3d. That the order, regular Medical attendance and administration of Medicine, cleanliness, airiness, diet, clothing, &c. of an Hospital; are found by experience necessary to the successful treatment of acute disease, and to be superior to any afforded by other institutions of whatever kind.

4th. That in European countries it is only the inexperienced of the Medical profession who can afford the time and labour requisite for the care of out door Dispensary patients, especially; whereas in all countries, the Hospitals are personally attended by the ablest and most experienced Physicians and Surgeons, because there the patients are concentrated: in short, he says, an Hospital is indispensable to the efficiency of Medical and Surgical practice.

5th. That the lower classes of society can have none of the requisites for the cure of acute disease except in an Hospital, because no where else can any funds afford them the professional ability or careful attendance obtainable in every well regulated Hospital.

6th. That by a transfer to an Hospital the indigent sick are removed from the locality (and that generally a bad one) where their disease was contracted: this of itself goes far towards the cure of many diseases, such as periodic fevers. Again, it is not, even in the most dangerous diseases, by medicine *alone* that a man's life is to be saved, but by the careful and continued watching of the operations of nature and those of medicine. so as to determine when to give or withhold drugs. It is only in an Hospital that such mode of relief can be afforded, and it therefore follows, that dispensaries however useful, take but a secondary or subordinate station. In the crowded, ill ventilated city of Calcutta, the difficulty of finding suitable localities for a number of mixed dispensaries would alone prove a serious objection to such a plan of relief so paramount in regard to health is an airy open position.

7th. That the attendance on large bodies of sick in their own houses would be obviously impracticable, even were it desirable, on account of the great number of assistants required in the straggling city and suburbs of Calcutta, to administer treatment; and the cost of such establishment would be enormous. A Dispensary, wherein medicines are exhibited, is useful to keep a certain number of men out of Hospital, no small benefit, in a preventive sense; but it can never supersede the necessity for the Hospital itself.

8th. That Dispensaries at the best afford but uncertain and partial relief, in acute disease especially, because the results of treatment cannot be accurately observed: the patient gets his medicine by chance, and has such diet and clothing as the mistaken notions of friends suggest; or if indigent, he absolutely wants both; lastly, he returns to the place where he contracted the disease, to sleep on the

damp ground. Of some of the best conducted dispensaries at home it has been said that the patients are "lost sight of: some remain on the books for years; no one knows how many are under treatment; according to the fancy of the reporter, those who cease to attend are said to be cured, uncured, or discharged for non-attendance."

9th. That in Calcutta, the very focus of the worst fevers, we have three great dispensaries, while no hospital or other institution exists, for the treatment of natives suffering from fever and the other diseases incident to a bad climate. In Ireland, so often cited, there are about 500 dispensaries, 49 hospitals and infirmaries, and 71 fever hospitals. These institutions are supported partly by annual Parliamentary grants, "partly by county presentments, and *some portion* by *private* contribution."

10th. That a dispensary cannot be rendered a school of practical medicine or surgery for the instruction of students. It is in a well ordered hospital alone that a school of practice in either branch can be found.

Dr. D. Stewart, 14th January 1836 and 1st May 1837.

Dr. Stewart considers the discussion regarding dispensaries as one greatly to be regretted, as tending to divert attention from the grand object, to one of second importance.

The dispensaries of Calcutta provide merely for the *alleviation* of disease, very imperfectly for the *study* of disease, and not at all for the *treatment* of disease, in the acute forms peculiar to the climate, while hospitals, in addition to those important objects, superadd the higher aim of preventing the diffusion of disease among the healthy, and are allowed to be the only schools where disease in all its *varieties*, can be duly studied, and the habit acquired of correctly observing and recording its phenomena, and the effects of remedies.

Dr. A R. Jackson, 14th January 1837 and 18th May 1837.

Dr. Jackson concurs in all that is said by the previous witnesses on the entire superiority of hospitals. In any country, he says, very little knowledge of disease is obtainable from a dispensary, and in this country less than in any other, from the extreme irregularity with which relief is sought. On these and many other grounds, he thinks, there can be no difference of opinion as to the better school of practical medicine. In cases where the funds are limited, in European provincial towns and villages, more may probably be done towards this prevention of disease and preservation of health generally, by dispensaries, when once the inhabitants are instructed in the advantages of early application on the first appearance of illness; but in large cities, where from the crowding together of the houses, and the consequent want of ventilation, the employment of the people in different manufactures and trades, exposure to all kinds of accidents, acute and sudden attacks of disease must necessarily occur both in greater number and severity.

Dispensaries can afford little or no relief as to prevention, and certainly none as to treatment, for it is only in the wards of a well provided and attended hospital that this can be accomplished, either with benefit to the patients, or satisfaction to the practitioner; and Dr. Jackson does not believe there is another city in the world of the same extent, or of the same wealth as Calcutta, where there are not three or four institutions of this description, amply and liberally provided for.

Dr. Jackson cannot for a moment put the two plans in comparison as far as Calcutta is concerned, and is fully convinced that without an hospital the good effected, in the formation and maintenance of dispensaries, will prove a most inadequate return for the money expended.

F. H. Brett, Esq 25th January 1837.

Mr. Brett is of opinion that dispensaries, in whatever number established, would not meet the evil arising from want of medical attendance. The reasons are, that the diseases cannot be watched, and if the first dose is not successful, the patients too frequently lose their confidence.

2nd. They take but half the dose given at the dispensary, or none at all: in the first case, it only nauseates or does harm, and they never come again ; thus their prejudice against European medicine is confirmed, and the native empirics keep up this feeling. It happens in consequence of all these, that acute disease generally terminates fatally.

3rd. The Apothecaries, who conduct the duties of the dispensaries, possess no thorough knowledge of their profession, mistakes in medical and surgical cases thus become serious.

4th. All the more important remedies which have the greatest controul over diseases, and the effects of which require to be watched cannot be employed systematically ; your efforts fall into disrepute, and the aversion to resort to European medical aid is increased.

5th. The want of power to regulate diet is a matter of importance, and so is the want of such articles as we consider proper; these latter cannot be had at the dispensary, and the causes stated retard both the cure and convalescence. The expences of a good hospital are less than of dispensaries, those of the two existing dispensaries, would be sufficient to support an extensive and thriving hospital.

Dr Goodeve, 8th May 1837.

Dr. Goodeve states that generally he would say an hospital is far more useful and desireable in this country than dispensaries, because in the latter you lose sight of your patients. In dispensaries you may give medicines to 500 patients, but you do not know whether they take it or attend to the directions given to them as to food, time of taking medicine, &c. &c. all of which is watched in an hospital, and severe acute cases cannot be treated at all, dispensaries in England are very useful; but, adds Dr. O'Shaughnessy, have never superseded hospitals.

Dr. O'Shaughnessy, 13th May 1837.

Dr. O'Shaughnessy begins a very able report by stating that dispensaries are of three kinds.

1st. Those in which medical relief is afforded only to persons who themselves come to the dispensary.

2nd. Those in which the sick are visited in their own houses by the medical officers of the establishment.

3rd. Those which in addition to the two previous systems have a few beds provided for the reception and treatment of patients.

The *first* of these kinds, that are at this moment in existence in Park-street, and Gurranhutta, is obviously only applicable to the treatment of persons labouring under such diseases or accidents as permit them to incur the fatigue of frequent visits, and is clearly useless as a mode of relief for cases of fever, dysentery, cholera, acute visceral inflammations, for fractures or dislocations of the lower extremities and a host of similar surgical cases.

These dispensaries consequently make no provision for the most urgent common maladies. They give much relief it is true in all the details of the surgery of minor accidents, in the treatment of syphilitic and cutaneous diseases, and of some chronic affections. Besides their inapplicability to the management of acute disease, these institutions are moreover, and as a necessary consequence, of proportionate inutility as sources of instruction. The expence is also great; but great as is the expence, and the relief it affords however disproportionate to the mass of sufferers which needs assistance, still the quantum of good it does is certainly very well bestowed.

The second kind of Dispensary has been for many years established in Ireland, and more recently has been adopted in several large cities in England.

Dr. O'S. can speak of their organization and working from personal observation of several, especially those of Southwark, Newington, Camberwell and Peckham districts of London.

In these institutions a Physician or Surgeon attends daily at the General Dispensary, to prescribe for casual patients: this duty over, he visits at their own houses, the sick of his district, and he is obliged to attend lying-in women; for those duties which occupy his whole time and expose him to constant fatigue, he usually receives no salary, and in some cases a nominal reward of £60 to £100, per annum.

There can be no doubt but this system works well, nay admirably, for the sick poor, but it is obvious that it could only be carried into effect under the peculiar circumstances of the medical profession of England.

Such Dispensaries are altogether useless as sources of primary education, indeed no one is appointed to them who has not completed his professional studies: were it otherwise, were this allotted to mere students destitute of previous clinical experience it would be the sources of evil infinitely greater than the good they now accomplish.

At present it would be quite impossible to establish these visiting Dispensaries in Calcutta.

The elder medical officers are too much occupied in practice, or other duties, to make them available; the junior officers are too few in number and all moreover thoroughly occupied in peculiar duties.

As to employment of the native students of the Medical College as visitors, I have no hesitation as one of their teachers in stating my conviction that such a measure would be a calamity to the sick and fatal to the success of the College

itself. The young men are still necessarily destitute of any knowledge of disease, and under the present imperfect provision for their clinical instruction, some years must elapse before they *ought* to be trusted with the care of a *single serious case.*

I say this with some reluctance because it is an admission of the inutility and failure of our institution, unless its clinical arrangements be differently organized, an event which may possibly be indefinitely postponed.

To sum up his opinions on this subject, Dr. O'Shaughnessy observes. that a joint system of Hospitals and Dispensaries is requisite to fulfil the great object of relieving the sick, an object which embraces *essentially* the provision of an hospital of instruction for the native *medical pupils.* I would suggest then that the contemplated Hospital be made essentially a clinical school, organized as closely as possible according to the Edinburgh system.

2nd. That the two Dispensaries now in existence be continued for two years from the opening of the clinical hospital, and then abolished, and that in their stead six Dispensaries be established in Calcutta and the suburbs.

Gurranhutta, Park-street, Kidderpore, Entally, Seibpore, Cassipore.

The total expense of this scheme would be :—

| | |
|---|---|
| Central and Clinical Hospital,.............................. Rupees | 1,200 |
| Six Dispensaries, ........................................................ | 1,500 |
| Superintendents, ......................................................... | 200 |
| Total Rupees,...... | 2,960 |
| From which deduct two Dispensaries abolished,..................... | 1,120 |
| Total expense for Hospital and six Dispensaries,..................... | 1,840 |

This arrangement would provide for the treatment of *acute* disease in hospital and in the homes of the patients; would multiply three-fold the means of relief to chronic cases; would insure the education of the pupils; provide them with respectable and sufficiently paid appointments, and would meanwhile stimulate the present pupils of the school and attract others to the prosecution of such studies.

It would, lastly, enable us to provide in connection with the vaccine fund, efficient native surgeons for the mofussil cities, in every one of which Dr. O'S. would organise a Dispensary, such as that he proposes to establish in Calcutta.

We now proceed to lay before the General Committee an abstract of the evidences of such gentlemen as would appear to favor the establishment of Dispensaries.

Dr. Graham, 11th May 1837.

Dr. Graham considers the establishment of a Dispensary adjoining each Thannah, the most humane and most beneficial,—the Dispensaries to have a comfortable receiving hut, containing a certain number of charpoys.

Dr. Graham thinks that in times of great sickness many would enter such an asylum in their vicinity and near to their friends, who would rather die than be removed to a distant Hospital.

Dr. Graham would look for aid to the Native Police; for he says that the Thanahdars would hear twice a day at the least, the state of sickness within their superintendence: those individuals who were able to walk to the dispensary would be relieved, while others incapable of doing so from sudden and severe infliction of disease, such as cholera, could be seen and treated without delay.

The Dispensaries, 18 in number, or one to two Thannahs, could be visited once or twice a day by Medical practitioners at the Presidency, who doubtless would, under all circumstances considered, perform the duties with the same active benevolence as is exhibited by our brethren in Great Britain, who discharge it gratuitously.

W. Raleigh, Esq, 15th May 1837.

Mr. Raleigh, after stating the advantages of an Hospital over a Dispensary to be the more satisfactory and more certain opportunity of prosecuting medical treatment of the sick, and of ensuring those most important supports to the exertions of the Medical practitioners; regulation of diet, cleanliness and domestic attendance, states the objections to an Hospital to be, the very limited benefits which could possibly be afforded, by one Hospital of moderate dimensions; the heavy expence necessarily attending the maintenance of such an institution; and the prejudices of the natives against going to an Hospital for medical treatment; for notwithstanding what may be urged to the contrary daily experience convinces me, that however willing the natives are to resort to an Hospital for surgical aid, which is usually beyond the province of native doctors, they would be most reluctant to enter an Hospital in cases of fever or other medical diseases, which from their more obscure character, carry with them less intimidation, and are professedly manageable by the country practitioners of Physic, besides which, the circumstance of being surrounded by their families, and having their wants supplied in their own accustomed manner, would ever induce the native, however poor, to prefer his own hut to an Hospital, where certain restrictions are indispensable to good order. The advantage of a Dispensary is, that at a comparatively trifling expenditure, a much greater number of sick may be relieved, than could be at any Hospital of limited accommodation. The objections are that by the present manner of conducting Dispensary practice, the aid afforded must necessarily be deficient in severe cases of sickness, and no command can be exercised over the patients in securing them from exposure or irregularities. I cannot however but think, that a Dispensary established could be conducted on principles, calculated to afford extensive and efficient relief and that too, in a way more consonant to the feelings and habits of the natives, than an Hospital could be, and with much greater economy.

This object appears to me easily obtainable by extending the present Dispensary system, and in addition to the mere distribution of medicine at the depots to those who are unable to walk thither for it, causing the more seriously sick to be visited at their own residence.

To effect such measures, it would be necessary to establish a sort of Medical Police, and it occurs to me, that such an arrangement as the following would be found to answer the desired object.

Divide the city into a certain number of districts; and at each district fix a Dispensary with the following establishment :

| | |
|---|---|
| 1 Apothecary at 50 Rupees per mensem, | 50 |
| 5 Native Doctors at 10, | 50 |
| 1 Bhistie, 1 Mather, and 2 Coolies, | 16 |
| House rent, | 20 |
| Total | 136 |

The whole Establishment to be resident at or near the Dispensary, and available day and night to calls of immediate importance, during a certain number of hours of the day; say from 9 A. M. to 2 P. M. the Dispensaries should be open for general distribution of medicine to those enabled to attend there; at which time the Apothecary and all, or as many of the native assistants as may be required, should be present to afford aid to the applicants.

During the morning and afternoon before and after the hours specified for attendance at the Dispensary (allowing time for meals, &c.) the native doctors should be occupied in visiting the seriously sick at their own houses, (within their particular district) all such cases should be reported to the Apothecary, who in instances of emergency, or danger, should himself visit the patient and direct the native doctor in the treatment.

The controul and regulation of the Establishment should be rested in a certain number of Medical men, resident in Calcutta, forming a Committee whose duty it should be to visit at regular periods, and superintend the line of Dispensaries.

Having placed before the General Committee, so much at length, the opinions of the several gentlemen named, we shall be very brief in our concluding observations.

We believe no one can peruse the evidence adduced above without arriving at the conclusion that, to an Hospital alone must we look to supply the desideratum of a place of relief to the thousands within this city and suburbs suffering from fever and the other acute diseases incident to the climate, and who are now destitute of any such place of resort. The union of an Hospital and Dispensary we consider objectionable, and that each kind of institution is best when confined to its proper use. The duties of an Hospital require all the time that can reasonably be claimed from the attendants of every class ; or without hurrying or confusing the officers in the performance of their duties, or doubling their numbers, the duties of both Hospital and Dispensary cannot be efficiently gone through :—one or either must suffer. We therefore think they ought to be kept distinct and separate.

We consider the questions now before us to be, what is best for humanity ? what is the best mode of procuring relief from acute disease ? On these questions

there never has, and cannot be much difference of opinion amongst persons, whether professional or other, at least in European countries; and the additional force of disease within the tropics, renders all argument founded on European practice and experience of more than usual power.

What would be the fate of an army in which acute disease were treated on the Dispensary plan, and how long could such an army exist, even on paper; yet, in matters relating to health, where is the material difference between a well ordered city and a well regulated Military force.

We believe furthermore, that an Hospital judiciously regulated will even be greatly cheaper than an extensive Dispensary system, such as that proposed ; at the same time that it affords an amount of relief incomparably greater ; and lastly, as a school of practical instruction for the youth of the Medical College, an Hospital alone must be looked to—a Dispensary being next to useless for such a purpose.

This question however is so unanimously agreed to by all who have given us their opinions, that we shall not further refer to it, than by calling the General Committee's attention to its paramount importance, towards securing success to the great experiment now under trial for perfecting the natives in the European systems of medicine and surgery.

Nor is the importance of such an institution for giving effect to the plan of the new Medical College a recent opinion ; so early as April 1835, Mr. Martin in his letter to the Governors of the Hospital, states "that it is in an Hospital alone they (the students) can ever acquire the practical knowledge which can render them generally useful," and this conclusion is amply borne out by all the subsequent evidence before the committee.

An opinion has been expressed by Dr. Graham and Mr. Raleigh, that the poorer natives are generally averse from seeking relief at an Hospital excepting in Surgical cases.

On this question we need only refer to the whole experience of the Calcutta Native Hospital, where during the last 45 years the majority of in-patients have been medical cases; indeed it is the numbers of such cases daily seeking in-door relief at the Native Hospital, and the utter want of any accommodation for them, that formed the original ground of Mr. Martin's suggestion to the governors of establishing the contemplated medical institution.

The best informed natives and native practitioners declare against the existence of any prejudice on the part of the poorer classes to entering an Hospital.

Modushuden Guptee says—"that the poorer classes of natives, have no prejudice against the Hospitals but the better classes have." Hospitals are not erected in any country for the "better classes," and the whole of Modushuden Guptee's evidence, shews, he does not well comprehend either the nature of Hospital relief, or the kind of persons for whom such institutions are founded :—on the subject of native feeling and prejudice, his evidence is worthy of some attention, although he wouldnot appear to be practically acquainted with the working of the existing Hospitals and Dispensaries, even within his native city.

By the subjoined return it will be seen that, notwithstanding every endeavour to keep the native hospital to the purposes of its institution, which are merely surgical, there were yet 2333 in-patients of a purely medical class during four years, whereas the surgical cases amounted only to 1561. Of the out-door applicants more than two-thirds are medical cases, and a large proportion of these would gladly avail themselves of in-door relief were any institution in existence to afford it them.

*Statement shewing the number of Medical and Surgical cases treated at the Native Hospital for the last four years, viz.* 1833-4, 1834-5, 1835-6, 1836-7.

| YEARS. | House Patients. | | | Out-door Patients. | Vaccination. | Total. |
|---|---|---|---|---|---|---|
| | *Medical.* | *Surgical.* | *Total.* | *Medical and Surgical.* | | |
| 1833-4........... | 557 | 344 | 901 | 81,382 | 393 | 82,676 |
| 1834-5........... | 583 | 440 | 1023 | 72,380 | 426 | 73,829 |
| 1835-6........... | 595 | 419 | 1014 | 75,281 | 401 | 76,696 |
| 1836-7....... ... | 598 | 358 | 956 | 75,680 | 401 | 77,046 |
| Total...... | 2333 | 1561 | 3894 | 304,723 | 1630 | 310,247 |

Respecting the site of the proposed institution, we agree with Mr. Martin in considering the river bank the most eligible position and for the reason he states, viz. on account of its elevation, aspect and exposure, convenience and suitableness to the native prejudices, access to water, &c. We are also of opinion, that such a site would be sufficiently near to the Medical College; indeed much nearer than many of the London Hospitals to the several schools of Medicine and Surgery.

S. NICOLSON.

J. R. MARTIN.

A. R. JACKSON.

## RESOLUTIONS PROPOSED BY THE 3D SUB-COMMITTEE FOR ADOPTION BY THE COMMITTEE.

Resolved, that an Hospital be established in a central part of the native town, such establishment appearing, by evidence before the committee, to afford the most effective relief to the poorer natives suffering from fever and other acute diseases incident to this climate;

Resolved, as the subscriptions have fallen short of the amount required, that the aid of Government be solicited in furtherance of the said charitable institution.

## *Appendix to the Report of the 3d Sub-Committee on the Fever Hospital and Municipal Improvements.*

To THE HONORABLE SIR JOHN PETER GRANT,
*Chairman of the General Committee of Municipal Inquiry, &c.*

SIR,

At the last meeting of the General Committee, it appeared to be your opinion and that of other Members, that a sufficiency of information on the subject of the best mode of relief for the sick poor of this city had not then been obtained.

In order to supply this deficiency we addressed a few queries to the gentlemen named in the margin, and their replies we have the honor to submit to you, for your consideration and that of the Committee. Dr. Macleod, Inspector General, Her Majesty's Hospitals. Dr. James Ranken, Secretary Medical Board. H Chapman, Esq. General Hospital.

We have the honor to be, Sir,

Your most obedient Servants,

(Signed) S. NICOLSON,
" J. R. MARTIN,
*Members of 3d Sub-Committee.*

*Calcutta, March* 26, 1838.

No. 1.

No 1. D. Macleod, Esq. to Municipal Enquiry, 3d Sub-Committee, March, 1838.

March, 1838.

*Replies by D. Macleod, Esq. Inspector General Her Majesty's Hospitals to the Queries put to him by S. Nicolson and J. R. Martin, Esqrs., Members of the 3d Sub-Committee of Municipal Inquiry.*

Q. 1. Are you familiar with Hospitals and Dispensaries in any of the great cities or provincial towns of Europe, and have you possessed the means of judging of their relative value in relieving or curing the disorders of the sick poor?

*A.* I am I believe as well acquainted with the Hospitals and Dispensaries of London, Dublin, Edinburgh, and several other large towns in Great Britain and Ireland, as most men who did not immediately belong to these establishments; as, in the course of my Military and professional life, I have visited nearly all of them, and resided for long periods of time in some of them, where I was in the frequent habit

No 1.

D Macleod, Esq., to Municipal Enquiry, 3d Sub-Committee, March, 1838.

of seeing the poor under disease, and associating much with their Medical attendants. I have likewise passed a considerable time in France, particularly in Paris, where more attention is paid to the manner of conducting Hospitals, and other Institutions for the cure and relief of disease, as well as for Medical and Surgical schools, than in any other country in Europe, and where, under different names, they have establishments exactly similar in their operation to our Hospitals and Dispensaries; that is, different Institutions for the treatment of internal patients, and others merely for affording advice and Medicine to the casual poor, who do not require or wish to become inmates of an Hospital.

The relative value of Hospitals and Dispensaries, in relieving or curing disease, it is difficult to estimate correctly, as the objects of the two classes of establishments are not exactly the same. Hospitals are for the most part large establishments supported by public or private munificence or by charity; they are chiefly for the relief of acute and other severe disorders, and some, as small pox, fever and plague Hospitals, merely for the reception of contagious and infectious disorders, and to prevent their spreading, by removing indigent people from their own close and ill-ventilated habitations, to spacious, clean, and airy apartments, when often the very change is all that is required to effect a cure.

Dispensaries, as I understand the word, and as far as I have seen the establishments so called, are for the mere purpose of affording relief to disorders of minor importance, in people who are capable of attending at these Institutions for advice or medicines, and who are almost always recommended to enter Hospitals as their disorders assume a more grave character.

Q. 2. Have not the European Hospitals generally been resorted to by out-patients for advice and medicine?

*A.* Many Hospitals, perhaps all in country towns, have a class of out-patients who attend for advice and medicine on stated days, and are admitted as in-patients as their diseases become severe; but this is merely a Dispensary added to the regular Hospital, and only intended to relieve slight disorders, or such as are in an incipient state.

Q. 3. Have you known Dispensaries with accommodation for in-patients? and if so, what number of sick could they accommodate?

*A.* There are establishments in London known by the name of Dispensaries, which admit in-patients, but the numbers they can accommodate are small, rarely exceeding ten or twelve, and these very generally the inmates of poor houses, or the most abject portion of parish poor.

Q. 4. Of the two descriptions of Institutions, above mentioned, viz. Hospitals and Dispensaries, which would you consider best adapted for the relief of the numerous sick poor of Calcutta, when labouring under the endemic diseases of this climate?

*A.* Hospitals are decidedly the only places in which the poor labouring under disease, endemic, epidemic, or contagious, can be treated with advantage in

any country; and I should suppose the same rule holds good with regard to Calcutta as to other places. If Dispensaries become places to receive patients in any numbers for the purpose of medical treatment, they in fact become Hospitals, and the same rules and regulations apply to them, by whatever name they are called.



Q. 5. In your opinion would an Hospital, on a scale to afford accommodation to eight hundred patients, and in which the various diseases are classed, be preferable to eight Dispensaries, (the buildings erected of the common materials of which native huts are built) with beds for the accommodation of one hundred patients in each, or twelve Dispensaries with a few beds to each, as has been proposed for Calcutta?

*A.* Eight hundred patients in an Hospital is a large number, and would require an enormous building, or what would be better separate buildings, so as to admit of such separation and classification as the character of the prevailing disorders might require or the experience of the medical attendants might lead them to adopt. The sick poor in such an Hospital would have the best chance of being restored to health that their station in life admits of, and at a smaller expenditure than in any other way could be accomplished, besides the greater facility with which medical men of talent and experience could afford them the benefit of their advice. Dispensaries for one hundred patients are in fact Hospitals, and would answer very well, if they could be built of as good materials, or on as good a plan, and be as well situated, as the larger Hospitals; but to make them efficient, they would require each a separate establishment of medical officers, and subordinates, and I am inclined to think the present state of the medical profession in Calcutta would hardly admit of such an arrangement, and be at the same time efficient. Buildings of the ordinary materials of Native huts would make bad Hospitals. They could with difficulty be kept clean and dry. An indispensable requisite for a good Hospital in all malarious localities is to be raised from the ground. I would consider a second story a *sine qua non* in a Calcutta Hospital for the treatment of acute and endemic diseases.

Q. 6. Which of the above establishments should you consider best adapted for forming a practical school of medicine for the students of the Medical College?

*A.* It does not admit of a doubt that the large Hospital, where diseases of all kinds come under treatment, and where the patients are classed and separated according to the nature of their complaints, is the best adapted for forming a practical school of medicine either for the students of the Medical College or for any other students. Small Hospitals would afford as good accommodation as large ones, if they were equally well constructed and with medical officers of as great experience and knowledge, and perhaps their being dispersed might have some advantages as regards the patients; but, as schools of medical or surgical practice, they would from their very nature be inferior to the large Hospitals.

Q. 7. To render the above institutions fully adequate to meet, in the first instance, the demands of the indigent and sick poor, and, in the second, to form a practical school of medicine, which do you think would be attended with most expence?

No. 1.
D. Macleod, Esq to Municipal Enquiry, 3d Sub-Committee, March, 1838.

*A.* I am not sufficiently acquainted with Calcutta to offer an opinion on the question of expence. But I conceive if the small Hospitals were built of similar materials with the large, and in an equally commodious manner, as regards the number of patients to be accommodated, the large Hospital would be the cheaper. If, on the contrary, the smaller Hospitals are to be constructed of slight and temporary materials, to last only for a few years, there can be no more comparison between their respective costs, than between the well being and comfort of the sick lodged in each.

Q. 8. Do you conceive that either of the above mentioned Establishments, taken singly, would prove more efficient for the purposes alluded to than a judicious combination of both, as has generally prevailed in England ?

*A.* I have not a doubt that Dispensaries, where the labouring poor would receive advice and medicine without being obliged to withdraw themselves from their daily occupation, would be a great blessing, save lives, and prevent many from having recourse to an Hospital ; but when they are attacked by serious diseases, when they become incapable of earning their living, and are confined to their mud houses, the Dispensary will afford very uncertain relief. The only effectual resource under these circumstances is the Hospital, in the airy and clean wards of which they will derive more real benefit in the first day, than the best advice and all the medicine in the Dispensary will afford them in a month's close attendance. The benefits of a well regulated Hospital are cleanliness, appropriate food, regularity, a purer air, good medical attendance, and above all the removal of the patients from their own filthy and polluted abodes, in all probability the focus and source of all their sufferings. They have none of these advantages at a Dispensary. But there is no reason why the benefits of both institutions should not be combined under one roof. The Dispensary might afford advice and medicine to those who were strong enough without injury to attend at the regulated times, while the serious cases would be at once taken into the Hospital. I do not think it would signify much in regard to practical utility whether the Hospital and Dispensary formed parts of one establishment, or were two distinct institutions under different Medical officers. To the question of comparative expence I cannot speak ; but, in a large and populous city, with an indigent and fluctuating population, there might be several Dispensaries usefully employed, while one or two large Hospitals to receive bad cases of all descriptions, epidemic and infectious disorders in particular, and the endemic disorders of unhealthy localities, appear to me to be a most pressing want.

Q. 9. From your observation of the state of the medical profession in Calcutta, do you think that a Dispensary-system, such as the above mentioned, distributed over the town, could be supplied with European officers in the numbers required for the due care of the sick ?

*A.* I do not sufficiently know the number of Medical men in Calcutta, or how far they would be disposed, or could afford, to devote the time necessary to discharge the duties of a large number of Dispensaries. Without efficient and regular attendance the Dispensaries would be of little use, and I should doubt that old and experienced practitioners could be found to give up more of their time to these places than occasional consultation. The probability is, therefore,

No. 1.

D. Macleod, Esq. to Municipal Enquiry, 3d Sub-Committee, March, 1838.

that the actual care of the sick would devolve in many of them on the subordinates, and that the benevolent intention of establishing them would be defeated, or at least be productive of little real good. In large Hospitals, the practice is rendered more easy and more effectual by the order that is established; the cases are classed and arranged for the physician: the servants and subordinates know their places, and experience renders their various duties familiar to them. The physician has little to do but to see his patients; and it is not too much to say that, in an establishment so regulated, the man of experience and professional knowledge will do more in an hour, than it is possible to do in a worse regulated establishment in a week.

In England, and in fact in all other countries as far as I know, the Dispensary Physician or Surgeon is very generally a young man looking for practice and striving to make a name; his time is not of much value, and it is very desirable for him to gain professional experience, and to acquire public confidence by giving up a considerable portion of it to the uncertain and varying labours of a public Dispensary. Thus both himself and the public are benefited.

The Hospital practitioner is again for the most part a man of experience, in full practice. He possesses public confidence: his time is of value to himself and others, and must be economised. The utmost that can be expected from him is to see that the labour of others is directed to its proper object, and to secure to the patients the benefits of his experience and knowledge, with as little sacrifice of his time, or injury to his other avocations, as possible.

In a well regulated Hospital the experienced Physician easily effects this, and it might be a public loss to insist on more from him.

The Hospital and Dispensary are therefore intended to serve different purposes, both useful and of great public value; but to derive the greatest benefit from them, the duties of each must be entrusted to different individuals. I do not know that the state of the medical profession in Calcutta will conveniently admit of this division of labour, but, if it will, I have no doubt the interests of charity and humanity would be best served by it.

If Government are prepared to give adequate remuneration to medical men to enable them to devote the whole of their time to public Hospitals, they may establish as many as they please, and with great benefit to the suffering poor; but, if they are to depend on the gratuitous labours of over-worked medical practitioners, it appears to me that the only feasible plan is to establish one or two large Hospitals, in which the sick can be collected and classed, and where the best advice the country affords can be given them, with as little encroachment as possible on the other duties of medical men.

If, in addition, Dispensaries can be established in particular districts, so much the better. The expense of them will be comparatively trifling, as a few servants, a room to meet in, and a place of security for the medicines and medical stores, will only be required. In all Hospitals sufficient room for examining out-patients can be afforded, with little or no inconvenience to the in-patients, or the rest of the establishment.

(Signed) D. MACLEOD.

No. 2.

James Ranken, Esq. to Municipal Enquiry, 3d Sub-Committee, March, 1838.

No. 2.

March, 1838.

*Replies by James Ranken, Esq. Secretary to the Medical Board to the preceding Queries put to him by S. Nicolson and J. R. Martin, Esqrs. Members of the 3d Sub-Committee of Municipal Inquiry.*

Answer to Query 1st.—I never had charge of a Dispensary in Europe, but know that in several towns where I have resided, particularly in Edinburgh and Glasgow, such of the sick poor as do not require constant Medical attendance, and find themselves able to walk, prefer visiting the Dispensaries occasionally, and living generally at home, to confinement in an Hospital.

Q. 2d.—Out-patients have resorted to all the Hospitals with which I am acquainted for occasional advice.

Q. 3d.—In most Dispensaries there are a few beds for patients, who meet with accidents, or are seized with sudden illness; but it is not usual to undertake the treatment of serious Medical or Surgical cases in institutions of this kind.

Q. 4th.—Dispensaries, certainly best adapted to the feelings and habits of the Natives, who dislike detention from home and the discipline of an Hospital, seem well calculated to meet the wants of the humblest classes of people, who suffer constantly from chronic affections of various sorts. But for the treatment of fever and acute diseases generally, or the performance of capital operations, I should consider an Hospital, in which the patients reside day and night, absolutely necessary.

Q. 5th.—An Hospital, substantially built of brick and mortar, for the accommodation of 800 persons, might be of the greatest utility in several ways during epidemics amongst the sick poor. Receiving the sick from their over-crowded huts, and ensuring them efficient treatment, it would cause that thinning of the population, which I think tends always in this country to check the spread of disease in a town or village. An Institution with 100 beds for patients, seems to lose the distinctive character of a Dispensary, and to become an Hospital; or it may serve for both. But, if constructed of the materials of common huts, secure against neither fire, rain, nor the vicissitudes of weather, I fear it would not answer the purpose in view, or enable a Medical man to do justice to the in-patients. Sheds might perhaps suffice, though indifferently, for Dispensaries, and eight or twelve of them in Calcutta would, I have no doubt, be of the greatest service to the inhabitants.

Q. 6th.—An Hospital of 800 beds would answer incomparably better for a school of Clinical Instruction to students of medicine than any number of mere Dispensaries.

Q. 7.—I am not qualified to give an opinion on the comparative expense of an Hospital and a Dispensary. A large Hospital to afford Clinical instruction is in my opinion an essential part of a school of Medicine and Surgery.

No. 2.
James Ranken, Esq. to Municipal Enquiry, 3d Sub-Committee, March, 1838.

Q. 8th.—The same building may serve for both an Hospital and Dispensary, and the combination of both might certainly effect more good than either of them could singly.

Q. 9th.—Were eight or twelve new Dispensaries established in Calcutta, an additional number of Medical Officers would be required at the Presidency.

(Signed) JAMES RANKEN.

No. 3.
Henry Chapman, Esq. to Municipal Enquiry, 3d Sub-Committee, March, 1838.

## No. 3.

March, 1838.

*Replies by Henry Chapman, Esq. General Hospital to the preceding Queries put to him by S. Nicolson and J. R. Martin, Esqrs. Members of the 3d Sub-Committee of Municipal Inquiry.*

There cannot I imagine exist any difference of opinion among medical men, who have had opportunities of witnessing the comparative results of the treatment of diseases at the charitable institutions in the large cities of Europe, regarding the vast advantages Hospitals have over Dispensaries, considered either as means for the relief or cure of the indigent sick, or as practical schools of medicine. The cases of acute diseases in Europe could not possibly receive from the Dispensaries the same care and attention as afforded to all Hospital patients, and, such being the case, it appears unreasonable to suppose that the poor of Calcutta, when labouring under the severe fevers and other endemics of the climate, should be able to obtain effectual aid from Dispensaries.

Attaching a number of beds, for the reception of the most urgent cases, to each Dispensary would, to a certain extent, be an advantageous arrangement; but to render the institutions effective it would be necessary to locate them all in the open and well ventilated parts of the town, to provide each with a proper Hospital establishment, and above all to secure the regular attendance, morning and evening, and even oftener, of European Medical Officers. But this, in the present condition of the profession in Calcutta, I fear would be impossible.

One large, well constructed, and well regulated Hospital in a centrical situation, with two or more Dispensaries in addition to those at present existing, would, in my opinion, confer more real benefit on the indigent sick of this city than the establishment of any number of Dispensaries, and at the same time afford to the Student of the Medical College an extensive field for the practical study of their profession.

HENRY CHAPMAN,

*2d Assistant Surgeon, General Hospital.*

*March* 10, 1838.

# APPENDIX F

TO

## REPORT OF COMMITTEE

UPON

# THE FEVER HOSPITAL

AND

# MUNICIPAL IMPROVEMENTS:

CONTAINING

## MISCELLANEOUS EVIDENCE AND PAPERS.

CALCUTTA:

Bishop's College Press.

1839.

# APPENDIX F.

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## ERRATA.

Page

102 Line 1 and 16, *for* '1,58,275-5-1' *read* '1,58,276-5-4'

109 Line 16 from bottom, *for* '[illegible]. Da Costa' *read* '[illegible]. Da Costa'

120 Insert 'Brought forward Co.'s Rs 633' above the word Secretary's Establishment.

131 Line 19 from bottom, *for* '180' *read* '92.'

132 Ibid, *for* '1768' *read* '1786.'

133 Line 12 from bottom, *for* '6601' *read* '3305,' and Line 11 *for* '3423 *read* '2212 or 1¼ to 1 Military.'

147 Line 27. *for* 'to the greatest' *read* 'for the greatest.'

156 Last line, *read* 'Medical' before "Code of Regulations."

206 Line 18. *for* 'which' *read* 'whose.'

207 Line 3. *for* 'which' *read* 'whose.'

227 Line 12. *for* 'J. Smith' '*read* 'T. Smith.'

243 Line 17. *read* 'which are' before 'framed.'

136 *For* No. 37 *read* No 38.

138 *For* No. 39 *read* No. 38 (a)

143 *For* No. 41 *read* No. 40.

## APPENDIX (F.)

### Contents.

# APPENDIX (F.)

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## *Miscellaneous Evidence and Papers.*

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### No. 1.

GOURMOHUN DAY.

*May 6th,* 1836.

To C. W. SMITH, ESQ.,

*Chairman to the Fever Hospital.*

DEAR SIR,

I contributed to the subscription of the intended Fever Hospital with satisfaction that it would afford relief to my countrymen who now suffer much or perhaps die under various instances of sickness without Medical treatment, and not from a view that it shall principally be used in erection of fine large building no way necessary for the accommodation of the people for whom it is contemplated. Should it therefore be your determination to build several Hospitals in different parts of Calcutta and its vicinity, which would prove of more real and extensive usefulness, I shall with pleasure undertake to build a Hospital Bungalow for the accommodation of 50 patients at my own expense, on your finding me a place fit for the purpose.

I trust there can be no impropriety at my suggesting that a better arrangement is required in dividing the Hospital to different accommodations for Hindoos of better and low classes as well as Mahomedans, for general relief of our countrymen, as there is a strong prejudice among them that they shall rather choose to be lingering under severe disease or dying with it, than to be placed with people who are of different footing with respect to castes, without which the Hospital would only be an asylum for those who become sick by drunkenness and other depravities.

I am, Sir,

Yours obediently,

GOURMOHUN DAY.

CALCUTTA,
*May 6th,* 1836.

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## No. 2.

### MR. JOHN PHIPPS.

*July 12th, 1836.*

To A. R. JACKSON, ESQ.,

*Secretary to the Committee for the Fever Hospital and Town Survey.*

SIR,

In ready compliance with the request of the Committee for information upon the subjects under its consideration, as set forth in your Letter of the 30th ultimo, I proceed to offer such observations thereon as occur to me, after a residence of upwards of forty years in Calcutta.

Want of Statistical Returns.

2. I am not aware that disease and mortality is greater in this City than in other densely populated parts of Bengal; indeed the want of statistical Returns of the actual extent of the population and mortality of Calcutta must render the estimate of any individual on these subjects, vague and inconclusive.

Malaria.

State of the Publick Drains.

3. I believe that malaria is universally deemed highly injurious to health. In many parts of this City, and more especially in the most densely populated parts of it not intersected by Streets which can be traversed by the scavenger's carts, the Drains, many of them merely irregular furrows in the soil without any brickwork, are continually left in a most filthy uncleaned state, emitting the most noisome effluvia, doubtless highly pernicious to the health of the inhabitants dwelling in such situations. Perhaps persons long inured to such nuisances become less susceptible of their pernicious effects than others would be. Such sinks of filth and consequent malaria are, I believe, but little, if at all known to any scarcely but to those who occasionally pass by; but lying for the most part in obscure parts of the City, are not seen by the higher classes. I speak from experience in my perambulations to the abodes of many of the poor, as a visiting member of the District Charitable Society.

4. Contiguous to my own dwelling there have long existed several cutcha Drains grievously offensive.

Ruinous buildings, jungle, weeds, filth. Publick tatties.

5. There are many vacant premises in different parts of the City in ruins, choked with jungle, rank weeds, and filth deposited by Natives; there are also several dirty Tanks in different quarters, which are also great nuisances from not being cleaned out. The Mehters' tatties [i. e. publick necessaries] are likewise an abominable nuisance; some improvement might be made in them; and the filth carts should be covered over.

Liquor Shops.

6. I have observed that of late toddy shops have increased contiguous to my premises, and of which my tenants complain as a great nuisance, causing the assemblage of numbers of the most loose characters, who throughout the night disturb the neighbourhood with their drunken and noisy frolicks and quarrels; a great number of the European soldiers from the Fort also constantly resort to those toddy shops. I allude to the new Bazar on the north side, near the west end of Jaun Bazar Street, where, till lately, no such shops had existed for upwards of twenty-five years to my own knowledge; the indulgence in such vices, I presume, cannot but be injurious to the health of those who habitually practise them.

7. In my humble opinion it would conduce much to the health of the inhabitants if (even small) Squares with Tanks were opened in those parts of the City most densely populated, to be kept clean by the Conservancy Department. Such a plan, I imagine, would not be so costly as at the first view might by some be conceived; the situations being obscure, and the land of little value comparatively, if the purchases of the same were proceeded with cautiously, the improvement which would doubtless result therefrom would enhance the value of the surrounding land, and thereby the revenue from the assessment tax could be augmented in a ratio sufficient perhaps to cover the interest of the capital required to effect the improvements suggested, which might be done gradually; say one Square in each year, or even at longer intervals. Tanks and Squares.

8. To reconstruct the Drains throughout the City so as to completely carry off all the water, which seems to be the most desirable plan, would, I believe, require a larger outlay than is likely to be provided for in the present times. Reconstruction of the Publick Drains.

9. With respect to the rate of assessment, I do not think it can reasonably be objected to, provided the proceeds be appropriated exclusively to the purposes prescribed by the Act. I have heard that large balances of the assessment tax have been suffered to accumulate, and that very considerable losses have been sustained thereby, which I cannot refrain from observing, must have accrued through remissness; because as the tax is charged only upon premises occupied, the collector's people can, so far as I can see, have no admissible plea for not knowing the individual proprietors or tenants (either of whom are liable) of the premises. I think that the bills should not be allowed to lay over, as the moveables or the premises are always attachable in case of default. I speak from my own knowledge, that assessment bills are suffered to lay over. Assessment.

10. As to the establishment of a Fever Hospital, I am of opinion (being at the same time aware that I may be deemed presumptuous in this declaration) that it would not be likely to effect the extensive relief anticipated. I know, from many years' experience, that the Natives are generally, from prejudice, very much averse to going into an Hospital. A Native is taken with fever—he or she will not go of their own accord—who is to take them to the Hospital? their friends will not do it. I have on numerous occasions endeavoured to persuade sick people to go to the Native Hospital, but have very rarely prevailed upon any to avail themselves of such relief. In several instances I have sent servants and others in a manner by mere force, otherwise they prefer taking their chance of recovery at their own homes; they however frequently apply to their employers or others for medicines, but they abhor the idea of an Hospital; these remarks are confirmed by many families with whom I am acquainted. I think Dispensaries more generally useful for Natives not under controul, than Hospitals; by the former a vast deal of relief can be afforded at a comparative trifling expense. I allude particularly to the Park Street Dispensary. Hospital and Dispensaries.

11. The frequent recurrence of extensive fires in the hot and dry season is productive of much loss and suffering to vast numbers of poor people; as a preventive measure, the construction of huts with straw or other combustible roofs, the great cause of fires spreading, might be prohibited. Where the huts are tiled, fires seldom take place or spread to any considerable extent. Straw and Tiled Huts.

12. During my long experience I have not found the Chowkedars of much use; I have frequently called them, but they have been ineffectual in suppressing noises at night. I have no doubt that they are frequently bribed by the keepers of liquor shops and street women. If respectable inhabitants, long resident on the spot, contiguous to the Thannahs, were appointed, unpaid, to make summary inquiries into slight cases reported to the Thannadars of personal quarrels, petty assaults, drunkenness, and such Venality in the Subordinates of the Police.

like, and to dismiss the cases with admonition or to order the parties to be kept in custody for reference to the sitting Magistrates, it would save these functionaries much time and trouble; and I have no doubt, rescue many from the arbitrary proceedings and oppression of the Thannadars and Chowkedars.

13. The candid manner in which I have submitted the foregoing crude observations I trust will not give umbrage in any quarter.

I am, Sir,
Your most obedient humble Servant,
JOHN PHIPPS.

CALCUTTA,
No. 5, Jaun Bazar Street,
*July 12th*, 1836.

## No. 3.

### G. J. GORDON, ESQ.,

*July 23d*, 1836.

To A. R. JACKSON, ESQ.,

*Secretary to the Committee of the Fever Hospital and Town Survey.*

SIR,

I had not the honour, as supposed by your Committee, of being a member of any former Committee appointed for objects similar to those of yours, unless in so far as the objects of the Committee of Improvements, of which I have been for many years a member, may be considered as of the same description.

Minutes of Mr. G. J. Gordon on the Salubrity of the Town.

My views as to the best measures for promoting the salubrity of the Town are given in the accompanying Minutes laid by me before that Committee.

The other members having coincided in those views, they were very extensively and successfully acted upon until our operations were brought to a close by want of funds.

Minutes of Mr. H. Shakespear.

I would further recommend your applying to the Committee of Improvement for two very valuable and important Minutes of Mr. Henry Shakespear's, dated respectively on the 13th January and 7th February, 1820; also for Lieutenant Schaleh's Report on the Levels of Calcutta, and the Plans which accompanied it.

Roads.

I may mention, that the course adopted for saving expense in opening new lines of Roads was eminently successful. The Committee of Improvement will, I have no doubt, be happy to supply you with proofs of this in the instance of Hastings' Place and the great Central Road, by furnishing you with copies of the abstract accounts of those improvements sent up to Government with their periodical Reports.

A very minute map of the Town on a large scale is in possession of the Committee of Improvement, an inspection of which might assist your deliberations.

Municipal Taxation.

With respect to further *municipal* taxation, I am of opinion, as far as my imperfect information entitles me to come to a conclusion on the subject, that it is neither necessary nor consistent with justice that any further local tax should be levied from the inhabitants of Calcutta till it can be shewn that those already levied are insufficient.

Assuming it as a principle which is not likely to be disputed, though contravened seemingly by act of Parliament, that the inhabitants of Calcutta are entitled to protection of their persons and property, as much as those of the Suburbs, or any other part of the country, at the expense of the general revenues of the empire, it is evidently unjust that they or any portion of them should be subjected to peculiar taxes to meet those objects. Yet such violation of justice has, in my judgment, actually been committed, in as far as the assessment tax has been directed by the Act to be applied toward the expense of the Police establishment for protecting and watching the Town. Its application to the expense of draining and repairing the Roads I admit to be quite proper, as those are purely local objects. Municipal.

The profits of the half yearly Lotteries have been granted by Government to the Committee for the improvement of the Town of Calcutta. This seems to me not fair to the rest of the country, in as much as those profits, whatever they may amount to, are not derived from the inhabitants of this Town exclusively; and if such a source of revenue is to be maintained at all, its produce ought therefore to go into the General Treasury. Lotteries.

A tax of five rupees per diem levied by the Magistrates (from retail venders of intoxicating substances) and a duty on liquors, together yielding, as I have heard, upwards of one lac and a half of Rupees per annum is of a less decided character, in as much as a tax of greater or less amount is levied from the same class of dealers and upon similar objects in other parts of the country. Abkaree.

If the Legislative Council should determine that both the assessment on dwellings and tax on liquor and venders should be applied to mere local objects, no further revenue than the four lacs thus raised would, I conceive, be requisite to accomplish every purpose connected with the salubrity and convenience of the Town—the opening of new Roads, construction of new Drains, cleaning and repairing both Roads and Drains, filling up shallow and putrid Pools, digging new Tanks, raising ground lying below the general level, and Watering as well as Lighting all the Roads and Streets within the precincts of the Town.

Should the taxes on liquors and venders of spirits however continue to be considered as portions of the general revenue, some other source of local origin must be looked to for the means of accomplishing the objects I have adverted to. I object to any increase of the assessment tax, because on well known principles of political economy it would for many years fall exclusively on the ten or twelve thousand individuals from whom the present amount is levied, and afterwards upon the poorest class of tenants occupying the meanest description of huts, long before the burden would be transferred by the proprietors of substantial buildings to their tenants.

I would recommend in preference, taxes on carriages, horses, and palankeens, because those would not fall at all on the classes subsisting by mere manual labour, and should those prove insufficient, consumption might be taxed by laying a duty on shops proportional to the actual or estimated rent of the premises required for conducting the business. Taxation.

With reference to the widely differing elements of which the population of this Metropolis is composed, the task of framing for its local Government a free and at the same time an efficient Municipal constitution appears to me one of great difficulty, if at all practicable, at a single step. Municipal.

Were the Governour General in the first instance to take upon himself the nomination of fifty or sixty persons selected from the most respectable inhabitants of the different quarters of the Town to form a common Municipal Council, dividing themselves into Committees for the different Wards or Thannahs, a foundation might be

Municipal laid for engrafting on such an Institution several privileges, such as election, &c. of which the Natives generally have not at present the slightest idea. Prudence would dictate the propriety of restraining the powers of such a body within very narrow bounds in the first instance, but these might be gradually enlarged in proportion as intelligence became diffused amongst its members, and their capability of using their trust judiciously and for the publick benefit became proportionally extended.

This body would be required to suggest to Government whatever they thought would conduce to the advantage of the inhabitants generally or specially, and the local Committees would carry into effect in their respective districts such measures as Government should authorise or direct. I presume that it is not contemplated to arm any mere Municipal authority with judicial powers, or to extend to this country European Institutions, originally adopted in rude and unenlightened ages, when a great step was gained even in wresting the administration of misnamed justice from the arbitrary grasp of hereditary chiefs to place it in hands still incompetent to its proper exercise, but less able to abuse it with impunity. I take it for granted that the protection of person and property of the citizens will continue to be reposed in the hands of qualified, stipendary, and permanent Magistrates, accountable only to the Supreme Court for their acts, and, *dum bene se gesserint,* independent alike of Government and of popular favour. Each of these Magistrates ought, I think, to be entrusted with the responsible charge of a Division, under such rules, subsidiary to the general provisions of the law as Government or the Bench assembled in Sessions may with the concurrence of Government determine. Credit or blame, where either is due, will thus attach to the individual Magistrate responsible for the good order of his own District, instead of being so divided amongst all as to be felt by none.

I know of no more effectual and at the same time economical means than this of generating a spirit of healthy emulation that cannot but tend to efficient discharge of duty; nor, on the other hand, can it reasonably be expected that such a spirit should exist under an arrangement like the present, where the Magistrate has but partial responsibility, because he has not immediate controul over the whole of the Police establishment of his Division.

These remarks and suggestions may, I fear, appear crude; but I am apprehensive of being deemed tedious were I to enter into details of the measures to which they would lead, or to offer arguments or illustrations in anticipation of objections to the principles on which they are founded. I am not indeed quite assured that the whole of the subjects on which I have touched come within the scope of your Committee's inquiries; but if not, I hope the Committee will excuse my unnecessary occupation of their time and attention in adverting to matters which, however important in themselves, may prove to be foreign to its objects.

I have the honour to be,

Your obedient Servant,

G. J. GORDON.

CALCUTTA,
*July 23d,* 1836.

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## No. 4.

### MINUTE

*Submitted to the Committee of Improvement, at a Meeting held 18th December, 1817.*

It is proposed that the following Resolutions be adopted by the Lottery Committee, as expressive of their views respecting the relative importance of the different objects which they are directed to carry into effect.

*First.* That the health of the inhabitants be considered as the first object to which the attention of the Committee ought to be directed; and that with this view their funds ought to be applied in the first place to the filling up altogether, or deepening and cleansing miry Tanks and Jheels, several of which exist at present in the most populous parts of the Town. In the second place, to preventing the accumulation of filth, by means of new Drains, common Sewers, or Kennels. And in the third place, to promote Ventilation, as far as can be effected, by cutting down high and spreading trees, and by increasing as much as possible the number and size of Streets or Roads running in a straight line from South to North.

*Secondly.* That next to the health of the inhabitants, the Committee should direct their attention in their improvements to the personal safety of passengers in the Streets, with a view to which object it would be highly desirable to widen the narrow parts of the most frequented Streets, where more commodious Roads in a parallel direction cannot be opened, and particularly to round off sharp angles. The safety of foot passengers should also be considered, and Foot paths formed betwixt the Wall and Kennel, wherever the width of the old Streets will admit of this, and in all the new Roads that may be opened by the Committee.

*Thirdly.* That convenience and ornament be also considered desirable. But that none of the funds of the Committee be appropriated to purposes where these are the only objects proposed, until all the foregoing objects have been accomplished, as far as may be in the power of the Committee.

*Fourthly.* That a preference be given to such plans of improvement laid before the Committee as combine the greatest number of important objects, at the smallest expense.

G. J. GORDON.

## No. 4. (A)

### MINUTE

*Relative to the opening of a number of New Streets to the Northward of Buhoo Bazar, submitted to the Lottery Committee at their Meeting of the 13th January, 1820.*

At a very early part of the proceedings of the present Lottery Committee, a Minute was recorded, indicating the relative importance of the several objects to which the funds intrusted to our charge ought to be applied. It was then stated, and I believe generally acquiesced in, that such improvements as held out the greatest promise of promoting the healthiness of the Town demanded our most particular attention, and it is on this principle, that I now beg to submit the following suggestions.

Those of our number even whose pursuits have been most remote from Medical inquiries, cannot fail to be aware of the great importance of thorough Ventilation to the healthiness of a populous place; or if evidence should be wanting to establish this doctrine, the history of London affords a most satisfactory illustration. Previously to the burning of that Metropolis in the year 1666, the visitations of the plague were nearly as frequent and as destructive to the inhabitants as they still are to the people of Constantinople or Cairo, where their recurrence seems most regular and periodical. The destruction of the greater part of the Capital on that occasion afforded an opportunity, which was not neglected, of widening all the principal Streets, which till then had been excessively narrow and confined, and consequently dark and filthy, at the same time, that the City overflowed with inhabitants; and from that era is to be dated the disappearance of the plague in Britain. It is not however to this disease alone, but to every other of which the infection can be conveyed through the medium of the atmosphere, that Ventilation may be considered as an almost perfect antidote; and it is also a fact familiar and well known to Physicians that there are few diseases to which the human body is subject, that are not most materially modified in the virulence or mildness of their character by the nature of the atmosphere breathed by the patient. The same remark applies even to cases that come more peculiarly under the province of the Surgeon, and where the effects of atmospheric variations could be least expected to manifest themselves. Hospital gangrene, a disease that frequently in the course of a few hours undoes all that nature and art have been able to effect in many weeks in the cure of wounds, and has ever been regarded as one of the worst and most destructive forms of disease, seems to be actually generated by confinement in crowded and ill ventilated apartments. That the same principle extends to this climate, might safely be inferred by analogy, if it were not proved by experience. To this point, however, I am myself enabled to speak decidedly, my inquiry having been constantly directed towards it for a considerable period, and more particularly since the first appearance of Cholera Morbus as an epidemick. For this my situation as a Commissioner of the Court of Requests has given me considerable facilities, as the general prevalence of any disease necessarily occasions the absence of a number of suitors, or their witnesses, the cause of whose non-attendance is always investigated by the Court. On such occasions I have generally found that the residence of those who are reported sick of any disease generally prevailing, is one of those mohullahs, removed from any open street, that consist of huts crowded together, so as scarcely to leave a clear space for a single person to pass betwixt them. There are none of the Committee, I presume, whom curiosity has not led to visit such spots; and they can testify that on entering any of them the filth is generally such as to offend more senses than one. But not only the healthiness of the Town but the safety of passengers, and the convenience of all classes of the inhabitants, would be greatly promoted by the construction of a number of straight and wide Roads, such as I am about to propose, which would necessarily afford a variety of access betwixt different parts of the Town that are at present connected by only one Street. For it is reasonable to expect that when there are two routes equally direct where there formerly existed but one, a proportion of those passengers who have usually frequented the old road will withdraw from it, and make use of the new; particularly if it be in any respect more eligible; and thus a greater proportion of room will be left for those passengers who continue to frequent the original road. The value of landed property would thus become more generally diffused and equalised than at present, and much ground that is now not only useless but noxious, from the neglected state in which it is suffered to remain, might be converted to valuable and useful purposes. My present object is to lay before the Committee a

mode by which such a measure may be effected, without incurring the enormous expense that would at first sight appear to be an insuperable barrier to its execution.

The principle on which I propose that we should proceed in effecting this purpose, and that too on the great scale, is, that we should avail ourselves of the enhancement that is given to the value of ground by its juxtaposition to a great thoroughfare. In order to be enabled to speak more decisively to the extent to which this principle may be safely relied on, I some time ago took into my service, on a monthly salary, two Land Brokers, whose sole employment has been to inquire into and report to me the price of landed property that is offered for sale in any part of the Town. From their statements it appears that ground, altogether independently of the value of buildings already constructed upon it, along which some of the most frequented roads pass, sells, in small parcels, as high as 1000 Rupees per cottah; while in spots not so advantageously situated, 100 Rupees per cottah can scarcely be obtained.

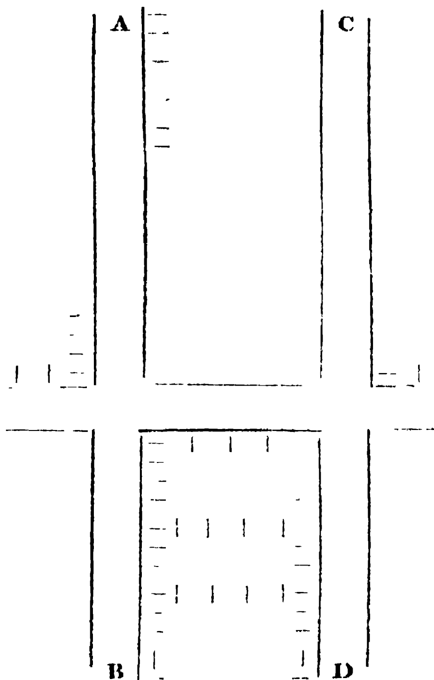
It is obvious, then, that if any one possessed of adequate capital were to purchase a tract of ground of sufficient extent in length to connect frequented points of the Town, between which there exists at present no communication except by an access circuitous or otherwise inconvenient, and were at the same time to possess himself of such a quantity in width as would leave a certain proportion to be disposed of beyond what would be required for the breadth of a road, he might in this way amply reimburse himself for the whole of his outlay. For instance, if it were proposed to make a road through ground which might on an average be procured at 100 Rupees per cottah, and the value of the ground adjacent to the road should as soon as it was opened rise to 300 Rupees per cottah, one-third of the quantity so purchased might be given up for the roads, and 100 Rupees clear profit be gained by the sale of the remaining two-thirds.

It may be objected that it is only to a certain extent that the ground on each side of a road derives value from its situation, and that in adopting any particular line as the most advantageous for opening a new road, a speculator must not reckon on being able to purchase ground contiguous to that line exactly to the extent that may suit his views. It may sometimes, for instance, be impossible to procure any spare ground on one side of the road without incurring an expense greater than can be recovered by the most advantageous resale; while in other cases it may be requisite to purchase the whole of a property presenting only a narrow front to the line of road, but extending backwards to a considerable distance, and of which therefore but a small portion would be at all enhanced in value by contiguity to the new thoroughfare. Making however every due allowance for the occurrence of such circumstances, I am confident that if a judicious choice be made for the general line in which it is proposed to open a new road, and if the Sub-Committee appointed to conduct the undertaking exercise ordinary judgment in making purchases of ground on the principle, and for the purposes already stated, the work may be completed at little or no expense to the Publick.

The portion of the Town to which I should wish the attention of the Committee to be directed in the first instance is that which lies to the north of Buhoo Bazar and betwixt the Chitpore and Circular Roads. Within that space, while the population is extremely dense, there would be found fewer obstacles from the occurrence of large and expensive buildings in the lines by which it would be advisable to carry roads than in the space between Chitpore Road and the River, or in quarters to the southward of the Buhoo Bazar, where the European population principally reside. The first object ought, I think, to be to penetrate the space thoroughly with wide roads as nearly straight as possible, and in the direction of the prevailing winds, so as that they might serve as channels for the free transmission of currents of air throughout their whole length. It would perhaps be prudent to undertake the construction of no more than one such

road in the first instance, but it may be of consequence, at the same time, to keep in view a general and regular plan of such improvements which it may ultimately be possible to accomplish.

The length of the Buhoo Bazar from the Chitpore to the Circular Road is, according to Upjon's Map, 5780 feet. Dividing this line into ten equal portions, nine parallel Roads might be carried from it in a northerly direction, each 70 feet wide and 515 feet apart. These might be connected at convenient distances by Cross Streets of the same width.




All the ground that can be procured betwixt the longitudinal Streets, when to be occupied by huts, ought to be so laid out that the distance between the rows in which they are built may admit free access to the air, as much as possible in the mode sketched in the margin; A B C D being positions of two Streets running north and south. There is no objection to a line of shops on each side, interrupted only by passages leading to the huts disposed in the rear. Those passages not being intended as thoroughfares need be only ten or twelve feet wide, but should be placed at intervals of at least 80 feet apart. The huts should not be built in immediate contact with each other, but spaces should be preserved between them so as to prevent them from totally obstructing the course of the wind. Each passage should lead to only a single row of huts, so that a clear space of 70 feet should remain betwixt each row, and the door of each hut should be placed opposite to the opening betwixt the huts in front to the southward. This might be made a condition in the sale of the ground, and the due observance of it might with propriety be left to the Conservancy Department.

I have already stated that the value of ground in Calcutta generally rises in proportion to its contiguity to a great thoroughfare, and that upon this circumstance rested the possibility of effecting the improvements proposed without expense, provided a sufficient capital were advanced for the purchase in the first instance. I regret to say that I have not as yet been able to possess myself of data on which to found any conclusive estimate of the sum that would be requisite for the purchases. From such as I have got, the following are the results—Of all the grounds offered for sale of which I have obtained any account, one third is of a price higher than the average likely to be obtained on a resale, and the rest lower. Classing the several lots accordingly, the average of the price demanded for the more expensive lots, including buildings, is about 888 Rupees per cottah. The price for which they might readily be procured would be probably at least ten per cent less, say 800 Rupees per cottah, or 16,000 Rupees per beegah. Of ground of this value no more ought to be purchased, if possible, than merely what will suffice for the breadth of the road. The average price of two-thirds of the ground offered for sale, as demanded in the first instance, is about 168 Rupees per cottah, and the real price probably about 150 Rupees, or 3000 Rupees per beegah. The average of the whole surplus quantity to be resold, I will take so low as 300 Rupees per cottah, or 6000 Rupees per beegah. The length of a street from Buhoo Bazar to Chitpore would be two and a half miles, or 13,200 feet. This multiplied

by 70 feet for the breadth of the road, gives $64\frac{1}{6}$ beegahs of ground. Of this quantity one-third must be purchased at the rate of 16,000 Rupees per beegah.

| | | | |
|---|---|---|---|
| $21\frac{7}{18}$ Beegahs at 16,000 Rupees per beegah, . .... .... | 342,214 | 14 | 2 |
| $42\frac{11}{18}$ Beegahs at 3000 Rupeees per beegah, .. .... .... | 128,333 | 10 | 8 |
| Total cost of space for road .... .... | 470,548 | 8 | 10 |
| Purchasing as much of the cheaper ground as would leave double the space of the road on each side of it for resale would cost .... | 513,334 | 10 | 8 |
| Total costs of first purchase of ground .... .... | 983,883 | 3 | 6 |
| Resale of $171\frac{1}{9}$ Beegahs of ground at 6000 Rupees per beegah .... | 1,026,666 | 10 | 8 |
| Profit | 42,783 | 7 | 2 |

leaving a small surplus towards defraying the expense of making the road puckha with Drains, &c. This estimate, however, it is obvious can only be considered as an illustration of the possibility of conducting the proposed undertaking at a trifling expense. I have already stated some circumstances which would go to disturb its accuracy, but the correctness of the result must in a great measure depend on the mode in which purchases are in the first instance conducted. If Government would authorise the Committee to buy all ground offering for sale at such a price that the rents of the ground would, after allowing for all expenses, yield net six per cent on the prime cost, great facilities would be thereby given to the completion of final arrangements with the proprietors of the ground on the line on which it might be deemed desirable to carry the road; and indeed the Committee might be in a good measure guided in the choice of a line for a new road by the quantity procurable on any particular line. Where the ground purchased by the Committee should happen not to lie in any desirable line for a road, the possession of it would still enable them to offer exchanges that would frequently put it in their power to dispense with the privilege of calling a jury and forcing a sale—a measure that should never be resorted to except in cases of absolute necessity.

## No. 5.

### MINUTE,

*For the Consideration of the Lottery Committee.*

I have ascertained from those most conversant with the subject, that water once drained out of the Town into the Canal leading to the Salt Water Lake cannot possibly find its way into the Town again. In the height of the rainy season the water in the Canal, at the springs, does not, I understand, rise above five or six inches.

At Brijeetollao, and in its neighbourhood, within the precincts of the Town, the Native population is small. The sickness which prevailed in that quarter at the close of, and during the past rains, is no doubt in a great measure attributable to the low and marshy ground in different parts of it. I have already brought that subject under the consideration of the Committee. I find that in the height of the rains the tide from Tolly's Nullah comes up the Drains on the south side of the Circular Road near Brijeetollao and crossing the road flows into the Drains nearly as far northward as what is called the Theatre Road, running east to west from the Circular Road, to the Theatre. This

might have a baneful tendency, but it probably cannot happen if proper attention is paid to the Sluice gate on the north side of the Nullah, nearly opposite the Allipore Jail; and, as I have before stated, the number of persons likely to be affected by it is small.

The Drains on the south side of the Circular Road being higher than those on the north, the water stagnates in the latter. This however is not the case later than the end of October, when they begin to dry up. It requires the knowledge of a professional person to determine how much the beds of these Drains may be raised so as to carry off the water to those on the south side, and care will be requisite that they be not so much raised as to affect the general Draining of Chowringhee. I have requested the Surveyor of the Town to report on these points, and shall again bring them under discussion.

With respect to other parts of the Town, the evils arising from bad Draining, low unwholesome Situations, and stagnant Pools, will not admit of being so easily rectified. For years back they have been complained of—plans of improvement have been formed, but little done towards correcting the insalubrity of those parts of the Town chiefly occupied by the Native population. I conclude they have failed for want of adequate funds. I annex copy of a Letter from the Chief Secretary to Government, dated the 24th of July, 1804, addressed to a Committee then existing for improving the Town of Calcutta, a copy of which was forwarded to the Magistrates of the Town on the 30th of that month. The improvements then contemplated, although sanctioned by Government, and intended to be defrayed from its funds, were never carried into effect. Why they were relinquished, or where the records of that Committee are to be found, I have not been able to discover; but if they were necessary *then*, they are greatly more so *now*, when the population of the Town, and particularly the European part of it, has so much increased.

Without the appropriation of a considerable sum of money on the part of Government towards the attainment of the object, it is hopeless to expect that any substantial improvement in the salubrity of the Town should be effected. The funds of the *Lottery* Committee, avoided from other sources, are inadequate to any works of magnitude; and the want of capital presents an insuperable barrier to their being attempted by individuals. Unless therefore the Government comes forwards to rescue the inhabitants of its Capital from the baneful effects of living in swamps and breathing a polluted atmosphere, the conclusion of each rainy season must bring with it a return of disease and mortality that has, particularly of late years, committed such ravages amongst the inhabitants of the Town.

It has been supposed that much of the unhealthiness amongst the inhabitants during the last few months has proceeded from the bad state of the Drains, and accumulation of dirt in the Town. That sickness amongst them arises in a great measure from the construction and state of the Drains, I have no doubt; but at the same time I am equally convinced that it arises chiefly from the exhalations and damp of low marshy ground and stagnant pools. I have reason to believe that the Town was never kept more free from an accumulation of dirt, or the Drains less uncleanly than they have been during the last six months.

The following statements do not support the supposition of increased sickness amongst the inhabitants during the past, in comparison with former years; at least not in comparison with the two preceding years in which the Cholera Morbus proved so destructive.

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*Statement shewing the number of Patients admitted into the General Hospital in the last Six Months of the years* 1816, 17, 18, 19.

| | 1816 | 1817 | 1818 | 1819 |
|---|---|---|---|---|
| July, | 34 | 67 | 140 | 159 |
| August, | 40 | 65 | 207 | 185 |
| September, | 70 | 85 | 275 | 113 |
| October, | 84 | 67 | 527 | 147 |
| November, | 136 | 89 | 353 | 157 |
| December, | 164 | 61 | 166 | 115 |
| Total, | 528 | 434 | 1668 | 876 |

*Statement of the number of Hindoos taken to the Cemetery at Kashee Mitter's Ghaut for the purpose of Cremation during the years* 1815, 16, 17, 18, 19.

| | 1815 | 1816 | 1817 | 1818 | 1819 |
|---|---|---|---|---|---|
| Fever | 645 | 412 | 493 | 668 | 839 |
| Dysentery, Diarrhœa, &c. | 1081 | 852 | 1269 | 951 | 1080 |
| Coughs, and Pulmonary Complaints | 223 | 153 | 147 | 149 | 140 |
| Various Diseases | 465 | 235 | 326 | 227 | 142 |
| Cholera Morbus | 182 | 141 | 1323 | 2776 | 889 |
| Total | 2596 | 1823 | 3558 | 4771 | 3090 |

N. B. This does not include Deaths occasioned by Small Pox.

Although these statements can convey no idea of the general mortality amongst the inhabitants; still, as they are taken from the same data through successive years, they may be considered some criterion by which a judgment may be formed of the comparative unhealthiness of the inhabitants during those periods.

I have inspected minutely the whole of the Town south of the Writers' Buildings, Loll Bazar and Bow Bazar Roads, and I subjoin some remarks that occurred to me, which may not be altogether useless to the Committee. I will hereafter submit further observations on the state of the northern parts of the Town.

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Memorandum on an inspection of the Upper South Division, that is, the part of the Town lying between Old Fort Ghaut, Writers' Buildings, Loll Bazar and Bow Bazar Roads to the north, and Chaunpaul Ghaut, Esplanade Row, and Durumtollah Street to the south.

The following places require filling up. A dirty Tank on the east side of Bow-Bazar Lane, property of Hurree Mull.

A dirty Tank in Hyderam Bannerjee's Lane, property of Hyderam Bannerjee.

A dirty Tank near Doorgachurn's house, not far from the new road to be constructed from Beparcetollah to the Bow Bazar, property of Pritram Baboo.

A dirty Tank to the east of Heeracutter's Lane, property of

A dirty Tank in Hazareeloll's Lane, property of Gourhurry Nundee.

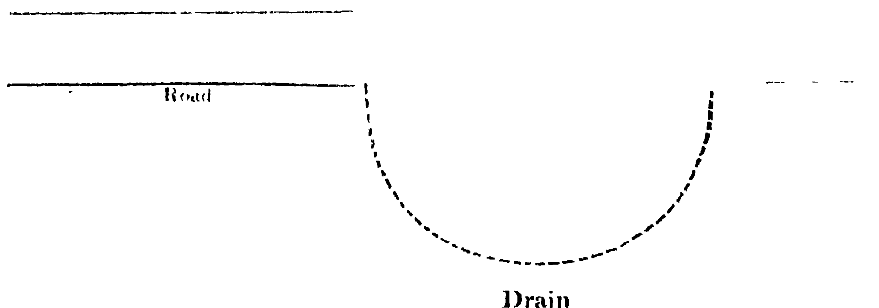
A dirty Tank in Mirzapore Lane, property of Mr. Bowers.

A dirty Tank of Gour Baboo, near the new Tank at Bepareetollah, commences an immense Drain which carries off a large body of water from this part of the Town, and empties itself into the Drain on the north side of Durumtollah Street, whence it is conveyed to the new Canal. On the side of this Drain there runs nearly the whole way, and within 100 feet of the Circular Road, a broad road of 25 or 30 feet in breadth.

On viewing this part of the Town two improvements suggest themselves, which I offer to the consideration of the Committee.

1st. That the road above mentioned be made to connect with the Tank and the Circular Road, and that the Drain be made puckha, by which the space it occupies will be reduced and leave sufficient for a good street.

2d. That a puckha Tunnel be constructed in the bed of the Drain, and the Road carried along the top of it. This will leave a quantity of ground on both sides of the road, the sale of which would partly repay the Committee for the expense of making the Tunnel. The space occupied by the Road and Drain measure at some parts forty and at others sixty and seventy feet—thus




at the east, and it would be necessary to purchase a small lower roomed house to unite the road with the Circular Road. On the west side some small buildings and huts covering a space of 200 yards must be purchased to connect it with the new Tank; but the advantages of the work I propose will be best seen by having a sketch of the Road and Drains prepared by the Surveyor.

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Memorandum on inspection of the Lower South Division, that is, all to the south of Durumtollah Road.

On the east side of Patvoree tollah there is a nasty Tank, the property, I believe, of Government—from this there is a deep Drain running eastward, almost in a straight line nearly as far as the Circular Road—nothing would be easier than the draining of this ground (between the Durumtollah and Jaun Bazar Roads) supposing this to be a Section of the Drain,




All the cross Drains running north and south might be surface Drains, whereas most of them are deep, and consequently the receptacles of filth.

A low Swamp or Pool, extending two or three hundred yards on the south side of the Jaun Bazar Road, near the Circular Road, to the north of Mr. Wilson's house.

A bad Tank on the west side of Narreeparrah Gullee.

A very bad one at Lalla Radhakistna's Gullee, east of Fenwick's Bazar.

The Drain projected to be cut through Toltollah Bazar, would greatly improve the draining of the northern parts of Colingah and the Talpoker Bazar.

Fenwick's Bazar is a very dirty place, and sufficient to make the houses in Chowringhee unhealthy when the winds set from the east. It is highly desirable that the road intended to have been made puckha, and carried through to the Jaun Bazar should be constructed. It should be made forty feet wide, and the ground on both sides raised and levelled to induce persons to purchase and erect good houses on it.

The south east part of Colingah as far as Colingah Street must be extremely unhealthy from the innumerable Pools, Swamps, and Tanks in it—nothing will correct this, but the purchase of a considerable space, digging a good Tank, and filling up the low places. The whole of Colingah is intersected with winding Lanes (and of course Drains) occupying unnecessary space, and most inconvenient for the inhabitants. I do not know any part of Calcutta more deserving of the notice of the Committee than this. It has been particularly sickly this season.

The south east part of Colingah between Colingah Street and the Burial Ground Road has also several nasty Pools in it, but is not so bad as that part of Colingah further north. A very excellent kutcha road runs nearly through the centre part of Colingah which ought to be made puckha.

Between the Burial Ground Road and what is called Theatre Road the ground is generally speaking well raised, and free from Pools. The fine broad road from Short's Bazar should be made puckha.

Between the Theatre Road and the Circular Road is the spot to the east of the Theatre which I have already noticed to the Committee as requiring to be purchased and raised. To the east of that again, between the continuation of Camac Street and the Short's Bazar Road is Brahmin-bustee. This spot has a fine Tank in it, and the surrounding ground is high, but it is divided by a broad Drain having grass and jungle on both sides, which in the rainy season must render the situation unwholesome.

This is a sketch of the spots above alluded to. The only way of getting rid of this Drain would be by digging a Tank to the east of it and filling it up.

H. J. SHAKESPEAR.

## No. 5. (A.)

To JOHN TROTTER, ESQ.,
*Secretary to the Lottery Committee, Calcutta.*

SIR,

In continuation of my remarks on the Southern parts of the Town, submitted to the Committee on the I request you will lay before them the following observations with respect to the Northern—they may perhaps enable the Committee to determine what improvements most deserve their attention.

I shall commence my remarks on the Upper North Division, which comprises all the Town lying between the Chitpore Bridge and Mahratta Ditch to the North, and Cotton Street and the Mutchooa Bazar Road to the South. Between the Baugh Bazar Road and Kutooah Street and the Shaum Bazar Road the ground is high—roads are much wanted, there are few, and those few, excepting the Dum Dum Road, bad.

The continuation of the fine broad street leading from the Chitpore Road to Gopemohun Deb's is very incorrectly laid down in Upjon's Map, in which it would appear to be a straight wide road, whereas from his house it becomes a narrow winding lane. It would be a considerable improvement to carry it out to the Circular Road the same breadth as it is so far as Gopeemohun's. At the west end of Kutooah Street, on the bank of the River, is Ruth Ghaut, on which the sum of more than 9000 Rupees has been laid out in constructing a fine puckha Ghaut, and a sluice gate for the purpose of draining the vicinity, but which has never yet been completed. It is my intention to bring this subject separately under the consideration of the Committee. It is highly desirable that this work should be finished, as there are several bad Pools on the south side of Kutooah Street, which in the rains overflow, inundating the houses, and rendering them damp and unhealthy, which the proposed Sluice and Drain would remedy by carrying off the superfluous water into the River.

Between Kutooah Street and Jura Bagaum Road the only improvement that occurs to me is the draining it, as before mentioned, into the South Drain of Kutooah Street, and so into the River at Ruth Ghaut.

From Jura Bagaum Road to Cotton Street the Town is beyond description dirty and unwholesome; the quantity of filth collected in different parts of it is enough to occasion a plague. This is no doubt in a very great degree to be attributed to the neglect of the Conservancy Officers, but still more so to the construction of the Roads and Drains. The former are chiefly in earth; the latter have been cut so irregularly, that excepting in the rains they can be of no service in carrying off liquid filth. Those few that have been made puckha are now so decayed that they tend rather to obstruct than to accelerate the passage of water—many of the Lanes are so narrow that a wheel-barrow could scarcely enter them, and to this the scavengers attribute the accumulation of dirt. I confess I am at a loss to propose any plan by which these defects can be remedied.

A large central Drain to the River, and surface Draining on both sides, can alone correct them ; but how far this is practicable I have not ascertained.

The east side of the Chitpore Road, between the Shaum Bazar and Simla Road, does not call for any particular observations—there are several good Roads in earth which ought to be made puckha, but whilst so many in the central parts of the Town are in that state, I cannot recommend their being laid with brick.

Between the Simla Road and the Mutchooa Bazar Road the ground is pretty high. In the northern part is the large Drain finished by the Committee last year. The southern parts are intersected by numerous large Drains, which must keep this part of the Town free from water in the rainy months. Like other parts, however, it is full of Pools of bad water.

The south east quarter is thickly wooded. Both Simla Road and what is called Beebee Cooper's Road require opening in a more direct line to the Chitpore Road, the entrance to them at the west ends being very confined. In this space also there are several roads in earth which ought to be made puckha.

The Lower North Division is all the Town lying between Cotton Street and Mutchooa Bazar Road to the north, &c.; Writers' Buildings, Loll Bazar and Bow Bazar Roads to the south. Judging from the great depth of the Drains in the north east part of this Division, there are grounds to suspect that some error was committed in the original draining of that part of the Town lying on the east side of the Chitpore Road, in the neighbourhood of the Tiretta Bazar, which instead of being drained toward the Loll Bazar Street to the south, or to the Circular Road to the east, has been drained through the high land to the Mutchooa Bazar Road to the north.

It is too late to remedy this defect (if really one), but the draining of Tiretta Bazar and its neighbourhood (perhaps the dirtiest part of the Town,) might be improved either by cutting a Sewer in a direct line from the Chitpore to the Circular Road, half way between the Loll Bazar and Mutchooa Bazar Road, or, which will probably appear to the Committee more practicable and less expensive, by widening and making puckha the Drain on the north side of the Loll Bazar, on the principle adopted on the north side of the Durumtollah Steeet.

At present the Drain is of little or no use in draining the parts I speak of, and being in some places very confined and impeded by small arches, is indeed almost useless; whereas, by enlarging it, it would carry off a considerable body of water which must now find its way twice the distance, by numerous windings, before it reaches an open channel.

Allow me to press on the attention of the Committee, the consideration of the best mode of Draining this very offensive, and consequently unwholesome, part of the Town.

On the west side of the Chitpore Road, to the River side in this Division, the Drains are throughout the year for the most part full of liquid filth which cannot be carried away by the scavenger's cart, nor can apparently find any vent. It is partly absorbed and partly evaporates, which must render the air in a great degree noxious and unwholesome. The most effectual mode of remedying this, will be to construct a puckha Tunnel (on the principle of that near the Loll Digghee) from the Foujdar's house down Moorghyhatta Street, crossing the Old China Bazar Street to Jackson's Ghaut; a plan I believe that was once in the contemplation of the Committee. This work is of the greatest importance, and if carried into execution, would admit of the whole of this part of the Division being shallow-drained, which cannot otherwise be done unless there is some receptacle made, not only for carrying off the water, but containing a large body of it during the rainy months.

It would form a very desirable part of this improvement to purchase a range of godowns lying between the house occupied by Mr. Lackerstein (in front of Jackson's Ghaut) and the Old China Bazar, by which a fine street might be opened in that direction, comparatively at a small expense.

I cannot close these remarks without seriously recommending to the Committee that a systematick plan should be commenced upon for making puckha the Streets of the Town which are now in earth. I have given in a list of these Streets, with an estimate of the expense of making them puckha, and I propose that at least one of them be commenced upon every month. It will even then require five years to complete the whole.

I am, Sir,
Your most obedient Servant,
H. J. SHAKESPEAR.

CHOWRINGHEE,
*February 7th*, 1820.

# No. 6.

## G. J. GORDON, ESQ.,

*Secretary of the Fever Hospital and Municipal Improvements Committee.*
*March 12th, 1837.*

## MINUTE

*On the Amalgamation of the Court of Requests and Police.*

**With reference to the evidence of the Chief Magistrate, the Returns of the Magistrates of Divisions, and of the Commissioners of the Court of Requests, I beg to offer to the consideration of the General Committee the following suggestions, for the amalgamation of those two Courts.**

| | |
|---|---|
| Two Commissioners engaged in trying causes for (6) Six hours, .... .... .... | 12 |
| | 3 |
| Three days weekly, .... .... .... | 36 |
| Hearing claims to property in Execution, .... | 2 |
| Hearing Petitions, .... .... .... | 2 |
| Total hours, .... .... | 40 |
| Two Commissioners 5 hours each *daily* .... | 10 |
| .... | 6 |
| or | |
| Weekly, .... .... .... .... | 60 |

$\frac{60}{3} = 20. \quad \frac{20}{6} = 32\text{-}3.$

**At present the whole business of the Court of Requests is accomplished in about 40 hours a week. It never, I believe, occupied more than 60 hours a week, which we may therefore take as the maximum time likely to be required in the trial of small debts. If the three Commissioners sat daily, this extreme amount of duty would occupy each of them three hours and 40 minutes daily.**

**The causes tried by the five Magistrates, including commitments for trial at the Sessions of the Supreme Court, do not, I believe, in the aggregate, occupy more than 40 hours a week. This added to the time of 60 hours allotted for the greatest pressure of business in the Petty Court, gives 100 hours a week for the accomplishment of the business of both Courts.**

**This I conceive might be overtaken by five Judicial Functionaries without any overtasking, as it would require on an average less than 4 hours labour per diem from each. More than 4 hours labour in Courts of this description, where the Judge is engaged during the whole time of Sitting, in examining parties, and their witnesses, personally *vivâ voce* ought not to be required of Judicial Officers in this exhausting climate.**

$\frac{100}{5} = 20. \quad \frac{20}{6} = 3^{h}\ 40^{m}$

**By the union of the two Courts the following advantages would be obtained :—**

**Facility to Suitors who are now frequently at a loss to which Court they ought to repair for the redress of an injury of doubtful character, such as in many cases of Trover, Detinere, and Damage, where the wrong savours more or less of a criminal character. A Court thus constituted, would be qualified to award at once damages to an injured party, and punishment, where proper, for the offence by which the injury was inflicted, which cannot be done by either of the Courts on their present respective footing. Cases of Perjury.**

Conspiracy, and Fraud, are not unfrequent in the Court of Requests, but they generally escape unpunished, because the Commissioners have no authority to impose fines, or sentence to imprisonment in the minor cases of such offences, nor of committing to trial in the graver instances, without incurring all the loss of time and trouble incidental to the proof of the charge in the first instance to the satisfaction of a Magistrate, and again to the satisfaction of two successive juries.

A Magistrate might in aggravated cases commit at once for trial before the Supreme Court, or visit more venial instances of such offences with fine or imprisonment.

The *economy* of the proposed measure is obvious, as enabling Government to make considerable reductions both in the aggregate salaries and in the expense of the two establishments. The Chief Magistrate has stated that he thinks his place might be adequately supplied by an uncovenanted Officer on Rupees 2000 a month. The duty I would assign to a Chief Magistrate, in addition to that common to him and the other Judicial Officers would be to preside as Chairman of the Board of Magistrates at their deliberations on general matters of Police, and on rules for the conduct of the establishment of their own Office, and of those employed in the several branches of Police.

| | | |
|---|---|---|
| Allowing the Chairman | Rs. | 2000 |
| One Magistrate, | | 1600 |
| One Ditto, | | 1400 |
| One Ditto, | | 1200 |
| One Ditto, | | 1000 |
| The total Salaries of the Judges would be per Mensem, | | 7200 |
| or | | |
| Per Annum, | | 86400 |

| | | |
|---|---|---|
| Mr. M'Farlane, | | 36000 |
| " Blaquiere, | | 16800 |
| " M'Mahon, | | 14400 |
| " Robison, | | 12000 |
| " O'Hanlon, | | 12000 |
| " Brietzcke, | | 16800 |
| " M'Leod, | | 14400 |
| Junior Commissioners, | | 12000 |
| | Rs. .... | 134400 |
| | | 86400 |
| | Rs. .... | 48000 |

| | | |
|---|---|---|
| Savings in Salaries, | Rs. | 48000 |
| Ditto, Rent and Establishment, | | 42000 |
| | | 90000 |

At present the salaries of the five Magistrates and three Commissioners aggregate Rs. 134,400 per annum; the saving in salaries would therefore amount to Rupees 48,000 per annum.—The same Establishment would, with some additions, serve for the united Courts that is now employed in one.

This source I think would, inclusive of the Office Rent now paid for the Court of Requests, yield a further saving of about Rupees 42,000 a year, making the aggregate reach to Rupees 90,000 a year.

Were this plan of retrenchment adopted, two of the present Judicial Functionaries, besides the Chief Magistrate would remain disposable for other duties. To the Chief Magistrate the whole of the Civil Service is open; one of the others might be placed with great advantage to the Publick at the head of a Court of similar jurisdiction in the Suburbs, and another at Howrah.

I know of no one so competent to fill up the details of the foregoing outline as Mr. C. K. Robison, who unites to a Legal education the advantage of several years experience in both Courts.

G. J. GORDON.

*March 12th,* 1837.

# No. 7.

BABOO RADHAKANT DEV,
*March 14th, 1837.*

To BABOO PRASANNACUMAR THAKUR,
*Secretary to the Second Sub-Committee of the Fever Hospital & the Town Improvement.*

SIR,

I beg to send you herewith, the several answers to the 26 Queries enclosed in your Letter under date the 23d December, 1836, for the information of your Sub-Committee, and to apologise for the delay which has unavoidably happened in forwarding them.

As almost all the Queries are connected with the Conservancy Department, I thought it proper to obtain replies thereto from the Overseers of the 1st, 2d, 3d, and 4th Divisions of the Town, as well as those of the Strand and Esplanade Roads, in order to enable me to furnish your Sub-Committee with a full and correct information of the whole Town, instead of my neighbourhood only, and I trust they will be found satisfactory and useful.

With regard to my opinion on the general state of the Town and Police, I take the liberty to enclose a copy of my Letter to Mr. M'Farlane, dated 24th October, 1835, with a firm conviction that your Sub-Committee will endeavour to remedy the evils pointed out therein, and thereby confer an essential benefit on this City.

Anticipating the pleasure of being favoured with the result of your Sub-Committee's consideration of the above mentioned Papers, I have the honour to subscribe,

Sir,
Your most obedient Servant,
RADHAKANT DEV.

CALCUTTA,
*March 14th, 1837.*

# No. 7. (A)

To D. M'FARLANE, ESQUIRE,
*Chief Magistrate of the Town of Calcutta.*

SIR,

In pursuance of your desire, I take the liberty to submit for your consideration, as well as for the information of Government, the following observations on the present state and improvement of the Calcutta Police.

Offences against the Publick Peace.

1. The Thannadars having been prohibited to take or hear the complaints of aggrieved or injured persons, the breach of the peace is always committed even upon the publick streets—the acts of assault and trespass are constantly perpetrated on the body and property of individuals—the poor, weak, and country people are frequently beaten, wounded, and robbed—the Khalasees of all classes who sojourn and resort near the Mutchooa Bazar and other places often plunder the Bazars, and the articles of the petty venders and passengers, and beat them severely in their attempt to resist them, and maltreat the palanquin bearers as well as the Zunanah Doolees upon the publick road—the vagabonds and drunkards have lately made a practice of committing a kind of highway robbing on the Chitpore Road, particularly during the Hindoo holiday nights by snatching away the cloths, sticks, &c. of the travellers, and breaking their

limbs on their striving to escape; for instance, a boy of my neighbourhood had a blow on his forehead in the late Jhoolun yatra night. This practice first commenced at Simlah near Hedoowa Tank, but has since, as I am told, ceased by the deaths of the people who were notoriously the perpetrators. The oppressed individuals without knowing the names and abodes of the offenders, of course can neither complain before the Magistrates, nor have any means of redress. The recurrence of these heinous crimes might, I think, be easily suppressed by allowing the Thannadars to apprehend those who may be so detected in the acts of breaking the peace; for instance, in August last, a few days after my appointment, one Bulram Mitter, of Syam Bazar, called at my house in the evening, accompanied with his durwán, and complained before me that some of his wicked relations forcibly entered into his dwelling house, beat him and his durwán severely, and drove them out of the house, and that he intimated the circumstance to the Thannadar of Syam Bazar, who paid no attention thereto, saying, "Nalish leneka hokum nehi;" upon which I sent my man to the Thannadar, and directed him to go to the premises, to inquire into the fact, and to keep the peace during the night. The Thannadar did so accordingly, and the assaulters concealed themselves immediately, and the complainant remained in his house quietly, without experiencing any further disturbance. This was the salutary result of interference of the Thannadar in a tumultuous case.

Offences against the Publick Peace.

Thefts and Robberies.

2. It is worthy of strict notice and immediate attention, that thievery, robbery, larceny, or burglary is committed almost every day and night throughout the Native parts of the Town. Whenever the poor individuals go to the River to bathe or to any other business, shutting up the doors of their houses or huts, having no man to watch them the thieves avail themselves of this opportunity to cut the ties of the doors, or break open the locks, and steal all the things in the house openly at broad day light; and during the night they cut or dig holes through the walls, enter into the houses, and rob the property of sleeping tenants, and sometimes out of malice or revenge, take away the door shutters of the empty houses if they do not get any other things. When a man goes even from one apartment to another, keeping his door open, he cannot find his articles on his return. Should all the cases of depredation be described here to elicit impression, it would swell to an immoderate length. Under these circumstances, the Native inhabitants and sojourners of Calcutta are extremely alarmed for the loss and insecurity of their property. The sufferers having no hopes of their stolen property being restored to them, are naturally averse to represent their grievances to the Magistrates or Thannadars in order to avoid vexatious trouble for attendance, and swearing in the Police, in addition to the loss which they were obliged to bear patiently; for which reason only a part of the crimes committed are brought to the knowledge of the Thannadars, part to the Superintendent, and part to the Magistrates.

Causes of Thefts and Robberies.

3. The cause of frequency of such daring robberies and thefts is not to be attributed only to the absence of vigilance and activity on the part of the Thannadars and Chowkedars, but also to the free access allowed to the notorious thieves and convicts into the Town, which is now infested by all kinds of vagabonds. The robbers, convicts, and disorderly people of the Suburbs of Calcutta are, I am informed, also sheltered in this City, for fear of the perwannahs issued by the Magistrate of twenty-four Pergunnahs directing the Zemindars to keep them in custody in the Zemindary Cutcherries every day during the whole night. The freedom allowed to notorious rogues and evil disposed persons to reside at large in any part of the Town, without leaving any means in the hands of the Police officers for checking their conduct, is a serious cause of increasing robberies and other evil acts. If an old offender or one of notoriously bad character be apprehended on suspicion, he consequently despises

the authority of the Thannah, and rather threatens to prefer a complaint to the higher authority and thereby makes his escape, for the Thannah people well knowing that if he did prefer a complaint the consequence would be their dismissal, removal, or penalty.

*Gang Robbers.*
Note —The names are here written in the Margin of the MS. but omitted in the printing.

4. Upon inquiry from the Thannadar of Syampooker Division, I am quite surprised to find that fourteen gang robbers, whose names are written in the margin, are actually residing in his District, and perpetrating robberies fearlessly; similar evils are, I am told, existing in almost all the Thannah Divisions, wherefore the preservation of publick property and peace cannot be expected until the cessation of these calamities. To remove which, I beg to propose, that all the Thannadars should be strictly enjoined to bring before the Superintendent of the Police, all the notorious thieves, convicts, and wicked people in their respective Divisions, in order to record their names, visages, and abodes in his office, and to compel them to enter into recognisances to keep the peace, or to expel them from the Town with an express order that they should be confined or punished if they be found again in the publick streets or private houses.

Liquor Shops.

5. Liquor shops, Gaming houses, and Brothels are the places for resort of all sorts of evil disposed men; there are some kinds of checks for the two first mentioned places, but not for the last; in consequence of which wicked men and women walk freely throughout the Town almost during the whole night, and the publick strumpets do not register their names in the Police to enable the Thannadars to recognise them and their abode, and keep their doors open all the night for the wanton people, wherefore the number of adultery and robbery is daily increasing.

Thannadars and Chowkedars.

6. The removal of Thannadars and Chowkedars from one Thannah to another, at short intervals, is on one hand, a check against their extortions, but, on the other, an obstacle towards the detection of thefts, for unless a Chowkedar stays at a Division at least one or two years, he can hardly qualify himself to discharge his duty with advantage to the Publick. It is desirable therefore he should make himself habitually familiar with every habitation and recess of his Division, recognising, at the same time, all the people residing in the place.

Class of people from whom the Police Officers are chosen.

7. The present mode of appointing Chowkedars and their distribution adds not a little to the promotion of robberies; indeed the Chowkedars selected from among the standing candidates, most of whom are boatmen and tobacco sellers of Bakergunge and Chittagong, and beggars of the publick streets are extremely worthless, and form the chief abuses of the Police force, notwithstanding they might have been appointed with a good intention. Far from their being serviceable to the Police, they have proved rather sure bases to the prejudice of the publick property and peace. The regular Pykes of the Mofussil, and Burkundazes of Up-country are considered to be fit and useful Chowkedars. The Day Chowkedars are likewise of no use, and an unnecessary augmentation to the Police establishment, as since their appointment no advantage has been derived by the inhabitants, but the perpetration of thefts at day time is increased. They may be transferred to Night Chowkedars if required.

Judicial.

8. The form of deciding robbery cases in the Police is surely a source of encouragement to the reputed thieves; the decision of a theft committed at midnight hardly goes against the offenders for want of witness. Now what possible witness could the owner of the house bring forward to identify the person of a thief, and thereby substantiate the robbery committed at dark midnight; and how could a thief possibly enter a man's house in the presence of any one. If witness be produced that he actually perpetrated the theft, the thief is acquitted in the event of the stolen goods not being found on him. In such cases before the final decision is made, a strict inquiry of the publick and private character, and means of living of the offenders ought

to be made through the Thannadar and neighbouring people. Moreover a thief left untied and free from all bodily injury, is another encouragement to him.

9. Besides these, depredations are frequently and extensively committed by the domestick servants upon their European and Native employers, but the detection of the offenders is very uncommon, and the recovery of the stolen property is so unfrequent that it prevents the sufferers from giving notice to the Police of a considerable portion of the robberies of this description. Although it is not an easy task either to detect the domestick thieves, or the receivers of the stolen goods, yet if orders be issued, prohibiting Goldsmiths and others to receive or melt any gold or silver jewels, plates, &c. of any person, without a pass from the Police, and also the Brasiers to buy any brass or other metal utensils without such pass, as well as the Chowkedars of land and water, to suffer any individuals to go out of the Town with any valuable articles, or things, rupees, or notes, without producing a regular Police pass, it will probably be the successful means for detecting depredators and receivers of the robbed property. Thefts and Robberies that are committed by Domestick Servants.

10. Independently of the land robbery, the Bombetias, or River pirates, are now frequently committing depredations on the Ganges. They, as I am given to understand, rob the boats of passengers and merchants under the pretence of a search, and the Chaprassees or Peons of the Chowky Boats are sometimes known to assist them; for instance, on the midnight of the 4th October, an attempt was made near Coomartooly Ghaut to plunder the boat of a Sudder Ameen of Dacca (who is the brother of the Pundit of the Supreme Court,) under the pretext of a quest, and thereby occasioned a very great affray. This is, however, imputable to the utter inefficiency of the existing Guard Boat Establishments. River Pirates.

11. Although the Court of Conservancy was established in this City, yet the river Ganges is not duly preserved, but is made the common reservoir of all kinds of filth and ordure from this extensive and populous City. The water of the river Ganges is commonly used by the Hindoos for drink, ablution, and culinary purposes; it is therefore absolutely necessary that this water should not be corrupted by any kind of filth, as it is of the highest importance not only to their health, but also to the City inhabitants at large; in consequence of which I beg to suggest the following remedy—that of directing the sluices towards the Balia Ghaut lake or in its vicinity, and establishing sinks in some other suitable place; also that the filth should be conveyed there; to employ close carts, and nightmen for the purpose; and that the Magistrates to fine heavily any person who should be found throwing ordure into the River; by such means the health and comfort of the inhabitants of this City would be considerably promoted. Conservancy.

12. Ferry Boats are totally neglected from due attention of the Police officers, because the ferrymen neither keep large or secure boats, nor employ proper boatmen, or manjees and dandees, and overload their boats with people or passengers for their own interest, wherefore the ferries always become liable to overset and sinking into the river, causing in every blowing season a shocking destruction of human lives. I therefore deem it requisite to suggest that the necessary orders should be issued to employ regular Ferry Boats by ferrymen properly trained to their business, and to number and register the boats, together with the names of the regular ferrymen, or manjees in the Police, as well as to fix the number of persons to be taken in each ferry, with a penalty in deviation of the rule. By so doing, the lives of poor individuals will be saved from drowning in the River. Ferry Boats.

13. The Dingy wallahs are, I am informed, a great nuisance to people desirous of crossing the River; they insult all without common decorum or respect, insist upon people Dingy wallahs

Dingy wallahs. getting into their boats, and by pulling and pushing actually commit assaults on the persons resorting to the River side. They are notorious and audacious against all remonstrance; these should also be registered and their dingees numbered. They also choke up the Ghauts so as to prevent access to other boats, notwithstanding the orders affixed on boards by the Magistracy.

Roads & Drains. 14. Many of the Streets in the densely populated Native parts of the Town are most unwholesomely narrow, and several of the Drains of it are in a great offensive state, while the other Sewers are so narrow and shallow that when a heavy shower of rain falls, the water covers or stands on several parts of the Chitpore Road about knee deep, and particularly so near Guranhuttah, Joroosauko, Mutchooa Bazar, Foujdaree, Balakhanah, &c., for which reason an extensive improvement is much required. Lighting and Watering. The want of Lighting and Watering in the principal Roads, if not all the Streets in the Native parts of the Town, has proved extremely injurious and unhealthy to the Native population, the supply of which would contribute in a great measure to the preservation of the publick peace and the safety of passengers.

15. In conclusion, I beg to propose an economical plan—that as the Police has been divided into four Divisions, the superintendence of all the duties of Watch and Ward throughout the Town should be vested in four Division Magistrates, as far as their Recommendations respective jurisdiction extends, in order to enable them to know the particular circumstances of, and more or less of the crimes committed in their own Divisions; that the collection of House Tax should likewise be transferred to the Division Magistrates, who would annually make an estimate of the expense to be required in their respective Divisions for Cleaning and Repairing the Roads, Drains, and Bridges, and levy and collect a proportionate Assessment for the purpose, which would relieve the poor individuals of one Division to bear the burthen of assessment of another. The Ornamental Improvements of the Town should of course be made from the Lottery fund; and that the duty of the Conservancy Department, which I am now performing, should also be divided among the four Division Magistrates, provided they would undertake it, to preserve the cleanliness of the Town, and to promote the comfort of the inhabitants in their respective Divisions. The advantages of this plan would soon be realized, if tried for a short time.

I have the honour to be,

Sir,

Your most obedient Servant,

RADHAKANT DEV.

CALCUTTA,
*October* 24*th*, 1835.

## No. 8.

### MR. J. M. DOVE.

*August 8th*, 1837.

To THE HONOURABLE SIR E. RYAN,

*and Members of the General Committee of Management of the Fever Hospital, &c. Calcutta.*

GENTLEMEN,

As you are necessarily interested in the publick health of this City and of the Suburbs, I beg to bring to your notice the state of the publick and other Tanks, the water in every one of which is alarmingly low.

The drought which prevailed in the early part of the year, you are aware, completely exhausted all the Tanks in and about the Town, of water. The rain that has as yet fallen is not nearly equal to the supplies of former years; in consequence, the water in the Tanks is generally about three-fourths less than what used to be in them at this period of the year, in addition to which the River at this time is considerably below its usual level.

You are also aware that the River attains its greatest height at the first spring tides in the month of September, and that after this period the waters begin to subside, and that after the middle of October the fall is suddenly upwards of ten to twelve feet. Considering the short space that intervenes between the present time and the period when the River attains its greatest height; looking also at the extraordinary disposition of the weather and advanced stage of the season, which in a manner forbid the expectation of the usual supply of rain, I hope I may be pardoned if I suggest to you the recommendation to Government of the adoption of measures which may serve to fill all the Tanks, publick and others, with fresh water before the expiration of the season, and before the River fall; for it occurs to me that unless this be done, the Tanks will all be dry before February next, and it is needless for me to say what the consequence of such a casualty may be. In a matter of such paramount importance it is to be hoped that considerations of expense may not be allowed to interfere.

I have the honour to be, Sir and Gentlemen,

Your most obedient Servant,

*(Signed)* J. M. DOVE.

CALCUTTA,
*August 8th*, 1837.

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# No. 9

## D. M'FARLAN, ESQ.

*August 18th, 1837.*

To THE PRESIDENT

*and Members of the Municipal Committee, Calcutta.*

GENTLEMEN,

I have the pleasure to acknowledge the receipt of your Letter of the 9th instant (with its enclosure) touching on the probability of a scarcity of water being felt in Calcutta in the approaching hot season.

2. I am happy to be so far honoured by your Committee as to have it requested that I should inform you whether it is my intention to address Government on the subject of your communication. In reply I can have no hesitation in stating, that I will communicate your Letter and enclosure together with this reply to the Secretary to the Bengal Government.

3. The object of Mr. Dove's application is to state his impression that there will be a great drought in the ensuing hot weather. He leaves the remedy to you and the Government, only stating that no considerations of expense should be allowed to stand in the way of attaining the desired end, viz. securing for the poor an ample supply of water.

4. In my remarks on this subject I shall notice,

(1st) The probability of the event described by Mr. Dove happening.
(2d) The effects probably consequent on that event.
(3d) The means of providing against the event and its consequences.
(4th) The quarter in which those means should be used.

5. *First Point.*—By the annexed Return furnished from the Office of the Surveyor General, it appears that the fall of rain during the present year has been below the average fall in preceding years. This circumstance is well worthy of notice. But I am not aware that any consequence can fairly be drawn from the fact. It may as fairly be supposed that as we have had less rain in the commencement of the season we shall have a very rainy close of August, and a very rainy September and October, as that we shall have a deficiency in these months also. At the time of the receipt of your Letter a heavy fall of rain was experienced, which raised the water in the Tanks considerably.

6. *Second Point.*—If, as Mr. Dove supposes, we are to have no more rain, the consequences would, no doubt, be of importance to the poorer classes of the inhabitants of the Town. They would be driven to travel for water to Tank Square, to the Tanks on the Esplanade, and some other plentiful Tanks (the Loll Digghee is filled at the height of the freshes from the River, and the Tanks on the plains from Drains running into them, and are not likely to suffer from a deficient supply of rain water) or, if all fails, they must take to the River itself, or to the Circular Canal, which is full of River water, and in the dry season, is tolerably pure; the outlets of the Town Drains being, at

that period, perfectly dry. That the consequences of such a state of affairs would be very serious, I am not prepared to admit. Inconvenient and expensive it would no doubt be for a poor inhabitant of Colingah to have to proceed to the General's Tank, a distance of ¾ths of a mile, for water, but it can hardly be asserted that the prevention of such an event as this requires the powerful and immediate interference of Government, and the unlimited outlay of its funds.

7. The part of the Town most deficient in the artificial supply of water is unquestionably that situated south of the Bow Bazar and north of the Burying Ground. The principal Tanks in that neighbourhood are private. To improve the publick convenience of that neighbourhood by the construction of an handsome Tank would be an undoubted benefit. I have often wished to apply to Government on the subject, but have been deterred by a feeling that I could point to no available fund to defray the expense. Government might desire to be liberal, but why their liberality should be confined to that locality, and not extended to a thousand places in the Provinces, having a far stronger claim, can hardly be shewn to them; and unless we can shew that, I could not help thinking that we have no good grounds on which to apply.

8. Mr. Dove seems to point to some dire catastrophe, as a consequence of a scarcity of drinking and culinary water in certain localities of the Town: I confess I cannot apprehend any such.

9. *Third Point.*—On the means of providing against this scarcity Mr. Dove offers no opinion. If all the Tanks are to be dry, there would seem to be but little use in digging more, for they might get dry too. I conclude that his remedy is to construct abundance of steam engines and aqueducts.

10. If we determined upon the application of this power, it is clear that nothing could be done for the next year's service. If we had many lacs of Rupees this moment at our command, could we erect steam engines and construct aqueducts to distribute the water before April next? The present engine cannot do more than feed the present aqueducts, and the aqueducts cannot do much more than carry off the water supplied by it. The whole of Mr. Dove's apparatus must be new. Engines must be made, or sent to England for, and aqueducts must be constructed. Could all that be accomplished before April?

11. If the publick Tanks are to be filled in the rainy season with River water, a very curious question occurs, how far that supply would be permanent. There is no doubt that the level at which water stands in Wells and Tanks is affected by the River, and the periodical rains filtrating through the soil. Wells fill in a season of abundant rain, though they draw not a drop of water from the heavens, so would Tanks, to a certain extent. On the other hand, they sink in the dry season, though a drop of water may never be taken out of them. It follows, therefore, that the most effectual filling that can be given to a Tank in the rains would not maintain the level of the water in that Tank during the dry months much, if at all, above the level it would arrive at from the process of filtration constantly going on in the soil; and it may therefore be a question, whether the artificial supply thus given would be effectual for the remedy desired. But on this point the argument is needless. The only Tank that can at present be filled from the aqueduct is Wellington Tank. Wellesley Square Tank might be reached from the aqueduct at an expense of about Rupees 7000.

12. It is plain that Tanks could not be dug till next hot weather, even if they were likely to provide a remedy for the extreme contingency contemplated by Mr. Dove.

13. *Fourth Point.*—On the fourth consideration proposed, I remark, that as it would be impossible to provide any remedy for the evil contemplated by Mr. Dove, Government are not, therefore, called upon to expend money in an attempt to do so.

14. On the general point of the liability of the State to execute all works of this kind, I fancy I need not enlarge. In times when Government was more easily induced to part with its funds than at present, the idea that the improvement of the Town might properly devolve upon the Government was never entertained. The Lottery funds were specially devoted to the purpose, and a slight departure from that principle was permitted, in so far as the Magistrates were authorised to pave a lane occasionally at the expense of Government, and even that deviation from the general rule was allowed on the ground that Government levied the Town Duty Fund, which was generally admitted to be applicable to the publick improvement of the Town.

15. Since this fund has been abolished, I know of no source on which the people can rely for the supply of wants of this nature. In June, 1836, a petition (herewith forwarded), was sent in on this very subject, but it appeared to me hopeless to press the Government about it.

16. Whether it will be in the power of your Committee to suggest any means that will lead to the raising of such funds from the people, I cannot tell; but it seems certain, that a mere demand by the people of a small locality to expend money on their comfort, ought not to be ground enough for granting their request.

17. The publick spirited offers made by Rustomjee Cowasjee, on a recent occasion, have not, I fancy, lead to any practically beneficial result; and there was reason to fear that the small Tanks which he proposed to construct, would not afford the desired refuge in a very dry season. Large deep capacious Tanks are the only ones that can be relied on, and these cannot be made for small sums of money.

18. It occurred to me that the Government might out of special grace and mercy, grant, for the purpose of constructing a large and handsome Tank the site of the present Bytuckhanna Bazar, and leave the excavation to the liberality of Rustomjee, and other benevolent individuals. The price of the ground would be Rupees 20 or 25,000, and the cost of excavation, according to the annexed estimate, Rupees 5001.

I have the honour to be, Gentlemen,

Your most obedient Servant,

D. M'FARLAN,

*Chief Magistrate.*

CALCUTTA,
POLICE OFFICE,
*August* 18*th*, 1837.

P. S.—Mr. Dove mentions in the second paragraph of his Letter that the drought which prevailed in the early part of this season completely exhausted all the Tanks in and about the Town. This seems hardly correct, Tank Square Tank, the Tanks on the plain, Hindoo College Square and Cornwallis Square Tanks had an abundant supply of water.

D. M'FARLAN.

## No. 9. (A)

*Rough Estimate for excavating a Tank in Bytukhanna Bazar.*

| | Rs. | A. | P. |
|---|---|---|---|
| Coolies ... ... ... ... ... ... | 2000 | 0 | 0 |
| Baskets ... ... ... ... ... ... ... | 75 | 0 | 0 |
| Planks ... ... ... ... ... ... | 10 | 0 | 0 |
| Hoes ... ... ... ... .. ... ... ... | 16 | 0 | 0 |
| Surface Drain round the Square ... .. ... | 500 | 0 | 0 |
| Two Ghauts and two Bridges ... ... ... ... | 1200 | 0 | 0 |
| Posts and Balustrades round the Square ... ... | 1000 | 0 | 0 |
| Bricks, Khoa, and Konkea for laying on the Road round the Tank ... ... ... ... | 600 | 0 | 0 |
| Contingences ... ... ... ... ... ... | 200 | 0 | 0 |
| | 5601 | 0 | 0 |
| Deduct old materials ... ... ... ... | 600 | 0 | 0 |
| Co's. Rs.... | 5001 | 0 | 0 |

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## No. 9. (B)

*Statement, shewing the Annual Fall of Rain from the year* 1832.

| | 1832 | 1833 | 1834 | 1835 | 1836 | 1837 | Average of each quarter for 5 years. |
|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| January to end of March, First Quarter ... | 4·48 | 0·49 | 2·01 | 1·37 | 2·23 | 1·18 | 2·116 |
| April to end of June, Second Quarter ... | 9·16 | 18·77 | 21·26 | 30·40 | 7·45 | 9·78 | 17·408 |
| July to end of September, Third Quarter ... | 23·86 | 32·27 | 28·18 | 40·78 | 35·55 | ...... | 32·128 |
| October to end of Dec., Fourth Quarter ... | 7·08* | 6·40 | 13·92 | 9·13 | 0·16 | ...... | 7·338 |
| Total fall of Rain for each year | 44·58 | 57·93 | 65·37 | 81·68 | 45·39 | ...... | 58·99 |

NOTE.—From the 1st of July up to this date, the 15th of August, 11. 30 inches of rain has fallen.

* The M. R. for November of this year is missing.

*Surveyor General's Office,*
*August* 15, 1837.

JOSHUA DE PENNING,
*In charge Surveyor General's Office.*

## No. 9. (c)

D. M'FARLAN, ESQ.

*August* 18*th*, 1837.

To ROSS D. MANGLES, ESQ.,

*Secretary to the Government of Bengal.*

SIR,

Letter from Secretary to Municipal Committee dated Aug. 9, 1837, and enclosure.
Letter from Mr. Dove to me dated August 15, 1837.
Letter from Rustomjee Cowasjee, dated August 18, 1837.
Copy of my Letter to Municipal Committee dated Aug. 18, 1837.

I have the honour to submit for the consideration of the Right Honourable the Governour of Bengal the Papers noted in the margin, containing a discussion on the subject of a possible scarcity of water during the next hot season.

2. Might I venture to draw attention to the concluding paragraph of my Letter to the Municipal Committee. The construction of a handsome Tank near the great eastern exit from the Town would be highly ornamental, and an abundant supply of fresh water would be a great blessing to the neighbourhood, not in the Town only but in the Suburbs and to the inhabitants on the westerly margin of the Salt Lake. Perhaps the generosity of Government could not be better shewn than in the presentation to the publick of the present ruinous Bytukhanna Bazar; Rustomjee Cowasjee has kindly promised pecuniary support to the undertaking (see his Note annexed) and the remaining cost of excavation and removing earth, constructing ghauts and enclosures, could, I think, be raised by subscription among the wealthy and benevolent inhabitants of the Town.

I have, &c.

CALCUTTA POLICE OFFICE, (*Signed*) D. M'FARLAN,

*August* 18*th*, 1837. *Chief Magistrate.*

## No. 9. (D)

RUSTOMJEE COWASJEE, ESQ.

*August* 18*th*, 1837.

To D. M'FARLAN, ESQ.

MY DEAR SIR,

I am perfectly willing to engage to raise sufficient Funds for the purpose of digging the Tanks, provided Government give up grounds. I shall myself subscribe a certain sum, and get others to join me.

Yours, &c.

*August* 18*th*, 1837. (*Signed*) RUSTOMJEE COWASJEE.

True Copies,

(*Signed*) D. M'FARLAN,

*Chief Magistrate.*

## No. 9. (E)

*June 4th*, 1836.

To D. M'FARLAN, ESQ.,
*Chief Magistrate, &c. &c. &c.*

SIR,

We beg leave, respectfully, to draw your attention to a subject, the nature of which, we hope, will not be considered unworthy of your notice.

2. It is no less remarkable than true, that there is not a publick Tank along the line of the Lower and Upper Circular Roads; and the consequence is, that a grievous want of water is generally felt, both by Christians and Natives. Their present supply is obtained from distant private Tanks, belonging to garden houses of individuals, and stagnated pools; and free access is not always allowed to the former, from the caprice of proprietors, or the insolence and extortious disposition of servants.

3. We would accordingly, in this absence of one of the first necessaries of life, beg respectfully and earnestly, that you will do us the favour to submit the subject for the consideration of Government, and obtain its sanction for two publick Tanks being excavated in that direction.

4. These Tanks when excavated at due distances along the line of the Circular Road, exclusive of the comfort and convenience they will afford to the population, will tend also to enhance the value of ground, with a corresponding addition to the revenue of Government. They will further be ornamental, and useful at the same time as a resort for children of families resident in that part, and save many a Native from sickness, and perhaps premature death, arising out of the unavoidable use of bad and unwholesome water.

5. The site of the spots for the proposed Tanks we would take leave to recommend, are as follows—one near the place commonly known by the name of *Nabob ka Buggecha*, south of the bullock shed; and the other to the north of the premises of Bebee Ballard. These spots, or a portion of each, may be available by purchase for the objects in view.

6. The desire evinced by you at all times to improve the City for the comfort and convenience of the population, has emboldened us to address you, and we trust that you will be pleased to view the request now submitted with favour, and take measures to recommend, in the proper quarter, the early excavation of Tanks which are so loudly called for and so pressingly required for the health and comfort of those residing along the borders of the Circular Road.

7. The expense would be comparatively light from the cheapness of ground and other facilities along that line of Road.

We have the honour to be respectfully,
Sir,
Your obedient humble Servants.

CALCUTTA, *June 4th*, 1836.

J. WESTON, P. ATKINSON, W. S. LAMBRICK, J. PATTON, S. H. BOILEAU, C. H. SALTER,
W. H. PEARCE, C. REBEIRO, W. YATES, P. H. HOLMES, C. F. HOLMES. J. M. DOVE,
W. H. BOLST, J B. BISS, JOHN ANDREWS, F. LAWSON, G. S. HUTTEMAN, J. GOULDHAWKE, H. ANDREWS.

## No. 10.

### PROPOSALS BY D. M'FARLAN, ESQ.,

*For an improved Management of the Conservancy Department of Calcutta,*

*To the Owners and Occupiers of premises in Calcutta.*

The considerations which led me to propose to Government the outline scheme sketched in the accompanying Memorandum are,

1st. That evils at present exist connected with the Conservancy Department of the Police which are not likely to be effectually remedied unless the attention of the publick in general be roused and kept permanently directed, not only to the existence of the evils, but to the best means of removing them.

2nd. That it is on every account desirable that the inhabitants of a large Town like this should not only officially know the real state of their Municipal affairs, but have organs for the expression of their wishes on such subjects generally, and especially for carrying into effect whatever arrangements they may consider to be advantageous to themselves as contributing to their general comfort, or the salubrity of their Town.

For these reasons I would rejoice to see Committees of inhabitants formed in the several Divisions of this large and populous Town. Other advantages may follow, such as, increased publick spirit, leading individuals to devote some portion of their time, talents, or wealth to objects of publick utility, and a higher tone of feeling calculated to foster independence of character and regard for publick rights; should these results follow, they will, I am sure, be hailed with satisfaction by the Government.

It may be thought perhaps that the machinery proposed for the election of Committees is far more operose, and extensive than the end in view requires. Yet it is manifest that where funds, however small, are contributed to by all, *all* (within such limits as convenience and practical utility prescribe) should have a voice in their distribution; and it appears essential, that if these Committees come into operation at all, they should do so on the principle of their members being elected by the body of tax payers, or such portion of them, as on a common-sense view of the question, may be judged to compose a fit constituency.

I may mention that the plan sketched by me, and approved generally by Government, has been prepared at intervals snatched from the time incessantly occupied in current duties. From this, and from other causes, to which I need not allude, it may well be imperfect, and will, I have no doubt, receive important improvements from the free discussion to which I trust it will be subjected. This remark applies as well to the Division which I suggested as proper to be experimented upon, as to numerous other details; for the due adjustment of these the appointment of a preliminary Committee by the inhabitants would be desirable.

This is not the place to enter upon a full detail of the measures which I consider necessary for effecting an increased degree of comfort, cleanliness, and salubrity in the Town; but, as a practical exposition of the advantages that might result from the establishment of Committees, I would mention,

1st. The securing of greater efficiency and alacrity on the part of establishments at present entertained. This could hardly fail to be the consequence, seeing that there would be a constant supervision by the respectable inhabitants of the Ward, instead of the casual inspection that can be exercised by one or two Magistrates whose time is taken up by other business.

2nd. The economizing of establishments, and the application of consequent savings to useful works, such as the construction of improved Drains, Tunnels, Cesspool wells, and the like.

3d. The spread of information concerning the real difficulties in draining the Town, and of the various devices and means by which particular nuisances may be abated.*

4th. Preparing the way for obtaining additional funds to be applied under the controul of householders to objects† clearly shewn to be absolutely necessary for their comfort, by means either of the liberality of Government or of publick voluntary Assessment.

5th. Improving the receipts of the house tax itself, which may be reckoned upon as the result of increased interest taken in it by the inhabitants.

To originate and bring into practical operation Committees capable of effecting these and other similar objects, is to me, in my official capacity of Chief Magistrate, an object of the highest ambition, and I am glad to think that it is so with many of my brother Magistrates. I trust I do not deceive myself when I confidently anticipate the indulgence and cordial co-operation of the Publick at large in our endeavours to bring about this desirable end.

Should it appear that our present efforts are premature and that the Community is not yet disposed to take this trouble upon itself, I shall always have the satisfaction of knowing that I have done my best to effect an important object, and I feel confident that this or some similar arrangement will sooner or later be adopted.

Your obedient Servant,

D. M'FARLAN.

* It is not generally known that the Town Drains are not intended in theory to do more than carry off rain water, and that to put any nuisance whatever into any of them is punishable under Bye Law of 1814, and that almost the whole of them for 8 months in the year are dry at the Circular Road.

† Such as the widening of streets, filling up old and stagnant Tanks & the formation of new ones, and watering & lighting Roads.

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## No. 10. (A)

*Memorandum submitted to Government on the 1st December last.*

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*Chief Magistrate's Remarks on the Expenditure at present incurred for the Police of Calcutta in all its branches, with Suggestions for an improved Management of the Conservancy.*

1st. I shall commence by giving an Abstract of the different heads of account under which the Expenditure incurred in 1832-33 was classed :

| | | | | |
|---|---|---|---|---|
| Assessment, .. .. .. .. .. .. | Rs. | 282,589 | 9 | 11 |
| Sitting Justices, .. .. .. .. .. | | *104,957 | 3 | 8 |
| Town Duties, .. .. .. .. .. .. .. | | 33,368 | 5 | 11 |
| | | 420,915 | 3 | 6 |

* Exclusive of Magistrates and Superintendents Salaries.

2d. *Assessment.* The first of these heads of account is the Assessment. This is a tax of five per cent, levied by Act of Parliament on the real value of all houses, buildings, and grounds in Calcutta, and is appointed to be expended by the Justices of the Peace on Cleansing, Watching and Repairing the Town.

| | | | | |
|---|---|---|---|---|
| The annual expense of Watching is, Rs. per annum | | 119,641 | 1 | 5 |
| Of Cleansing and Repairing, .. .. .. | | 162,948 | 8 | 6 |
| Being an aggregate of Rupees .. .. | | 282,589 | 9 | 11 |
| Town Assessed at .. .. .. .. | | 300,802 | 14 | 12 |
| Remissions on account of empty houses, &c. .. | | 31,086 | 10 | 19 |
| | Rs. | 269,716 | 3 | 5 |
| Gross Collections within the year .. | | 237,805 | 13 | 1 |

This expense being greatly in excess of the net income of the tax, Government have always supplied the deficiency: probably on account of the direct interest they have in keeping down the expenditure under this head, and also no doubt from their having been hitherto the only body that has taken a permanent interest in the affairs of the Town, and assumed any controul over the Justices themselves. The Government have directed at different times what should be the strength of the fixed establishments, and have further ordered that the sum of Rs. 1000 should be the limit to which the Justices might go in the expenditure of money on specifick works within the meaning of the Act, or in the purchase of bullocks, implements, &c. This order however has not been construed to include the expense of repairing any given Street or line of Road.

3rd. The annual accounts under this head are revised by the Civil Auditor, and by him laid before Government with remarks, and are finally passed and recorded by the Justices in Sessions, where they are open to the inspection of the Publick.

4th. *Sitting Justices.* The next head of account is the Sitting Justices. Under this head are paid the establishment of Clerks, Native Writers, Moonshees and Constables attached to the Office, Law expenses, and the expenses of the Fire Engine establishment, repairs of the Esplanade Roads and the Tank establishment, the dieting of prisoners in the Police Prisons and the House of Correction, and of poor patients in the Police Hospital, Palanquin hire to Police Officers, Stationary, and other petty charges in the office of the Magistrates, and rewards for services rendered to the Police.

5th. Under this head no expense exceeding 100 Rs. can be incurred without the authority of Government. The account is subject to the Civil Auditor's scrutiny, but is not recorded with the Clerk of the Peace. The aggregate expenditure under this head for 1832-33 was Rs. 1,04,957: 3: 8.

6th. *Town Duty.* The third head of account is the Town Duty. During the administration of Mr. Adam in 1823, it was declared that the amount of the Town Duties should be devoted partly in aid of the Assessment Fund and partly to improvements in the Conservancy. In 1829 this order was cancelled, and matters reverted to the state in which they now are. It is right to mention that Mr. Adam's measure proceeded on the assumption of the existence of a surplus Revenue, and that the sums paid under this head are in truth disbursed from the general funds of the State, the name being retained as marking the kind of works to be classed under it.

7th. Under this head of account are paid certain fixed charges, viz. the expense of Watering the Roads, Rs. 17,552 per annum; of Lighting, Rs. 6,000 per annum; and all improvements, or new works* not classed under the head of Repairing. The latter has not exceeded (average for 10 years Rs. 35,671) 36,000 Rs. per annum; and the necessity of every proposed expense is closely scrutinized by Government. This account is also revised by the Civil Auditor, but is not subject to audit by the Sessions.

8th. These three Accounts and the charges for the Salaries of the paid Magistrates and Superintendent include the whole of the expense incurred under the head of Police expenditure for Calcutta.

It may be remarked that the Magistrates, as such, have no controul over the Lottery Funds, nor is any part of the Fees, Fines, Escheats, Abkarree Duties,† and Rents realized at the Police Office liable to be expended by them on behalf of the inhabitants. The Town Duties are levied by the Collector of Customs under the orders of the Board of Customs, Salt, and Opium.

9th. From the above review it appears that the only Fund over which the inhabitants of the Town have or at least ought to have a legal‡ controul is the Assessment, and that it is at present and will probably always be insufficient to meet the objects contemplated in the Act of Parliament. If there are no other Funds which the inhabitants

* Such as making Drains and Roads Pukha—widening Streets.

† These are collected by one of the Magistrates under the immediate orders of Government. The sums raised under this head were originally ordered to be expended in "maintaining and preserving the Publick Peace Good order, and Security of the Town of Calcutta and the inhabitants thereof."

‡ This controul would be exercised, I presume, by means of an application in regular form to the Supreme Court.

can claim as their own, or raise for themselves, it is clear that they must always be indebted to the Government for every improvement which requires money for its execution.

10th. There is certainly too much reason to fear that the state of Society in Calcutta is not at present sufficiently advanced, nor of a sufficiently permanent character to render it feasible or desirable that the controul and administration of the whole of the Funds expended on Police purposes should be vested in the hands of the inhabitants; but there is assuredly no reason why some approach should not be made towards a system under which the publick should enjoy some share in the administration of their own affairs.

11th. Good policy, it appears to me, imperatively requires that Government should reserve under its own management the whole of the stipendiary Police, and the funds necessary for its payment. The chief virtue of that Department of Police which has for its object the security of life and property, the protection of the Community from thefts and depredations, and the violence of turbulent mobs, is and ever must be unity and vigour of purpose and action. For this end it must be controlled by one head, responsible to the Government directly and the Publick generally, but not liable to be interfered with by individual knots of citizens; on the other hand, arrangements connected with the cleanliness and convenience of a neighbourhood, with the good state of its Roads and Drains can never be permanently managed with efficiency without the active assistance and constant interference of the Community itself.

12th. The attention, and fidelity with which the present District Charitable Societies discharge their duty are very remarkable, and I have often wished that it were possible to get the inhabitants of any given district to form themselves into a Committee of Conservancy for their own bounds. To this limited application of the principle of making the inhabitants of a Community regulate their own affairs there can, I am sure, be no valid objection; the difficulty will be to get them to do so.

13th. Even on this head I do not despair; first attempts may be awkward and ineffectual. The principal employeé's of Government residing at Calcutta, as the seat of Government, will probably do little in the matter; but even of them many will support the scheme by way of example and encouragement. The poorer classes again may be slow to apprehend it; still there is a large and a growing body of intelligent permanent inhabitants of Calcutta, who are well deserving of the notice and encouragement of Government, and who would be well pleased to find their position recognized, and a small share of power committed to their trust.

14th. The average amount expended on the Conservancy Department in each of the four great Divisions of the Town is as follows:—

| | | | |
|---|---|---|---|
| 1st Division,....................................... | 41,943 | 2 | 8 |
| 2nd Division,....................................... | 37,482 | 12 | 4 |
| 3rd Division,....................................... | 43,529 | 13 | 5 |
| 4th Division,....................................... | 39,829 | 15 | 6 |

The amount at which each Division is Assessed is as follows:

| | | | |
|---|---|---|---|
| 1st Division,............................. | 67,823 | 5 | 4 |
| 2nd Division,............................. | 74,619 | 9 | 0 |
| 3rd Division,............................. | 80,587 | 8 | 7 |
| 4th Division,............................. | 61,436 | 13 | 9 |
| | 284,467 | 4 | 8 |

That this expense will be very materially reduced under the present system of management, so as to hold out to Government a prospect of a diminished demand upon them, is not probable. In its disbursement therefore Government can have no object except that it should be done in a manner the most economical, the most efficient, and the most agreeable to the people. This latter point is of some consequence; the same work done by an arbitrary executive would not be viewed with the same favour as it would be if done by persons selected by the Publick themselves.

15th. (1) Let therefore the Government agree to give up this sum to the management of the inhabitants themselves according to the Divisions.

(2) Let a Committee of five (of which the Chief Magistrate and the Magistrate of the Division and any Honorary resident Magistrate should be ex-officio Members) be selected annually for its administration.

(3) Let all persons who had paid up at the date of election, house tax to the amount of — Rs. per annum be competent to vote for the nomination of Members of this Commitee.

(4) Let the Committee be competent to receive and revise the lists of establishment maintained for Conservancy purposes within its Division; to alter, modify, reduce, or increase them so as the allotted sum be not exceeded; to censure, or dismiss any part of the establishment, and entertain others; and to appropriate any saving within the year to such improvements in Draining and Paving, or Lighting, or Watering as they may judge best; to receive petitions in Committee on all matters connected with the purposes of their appointment, and finally, to receive quarterly, a statement of the amount assessed, and the sums realized on account of the house tax in their Division, with a list of defaulters, for such remarks as may be necessary. Individual members would of course bring to the notice of the Committee, repairs, whether petty or heavy, required to Drains and Roads. In cases where the object to be gained was common to two or more Committees they could meet to concert measures according.

(5) Let the Magistrates' vote be ordinarily on an equal footing with those of the other Committee men, but let them have a vote to be exercised according to their judgment in special cases—on which occasions the Committee will refer the case for the order of the whole Magistrates assembled at a Quarter Sessions, which should finally settle the point.

16th. It would be necessary, that a Committee, such as I have described, should be executive only, and not judicial, but they might cause complaints to be preferred before the constituted tribunals for offences under the Bye Laws.

Whilst the words of the Act of Parliament remain unrepealed, the Justices in Sessions are alone responsible for the administration of the Assessment Funds; the Committees must therefore, for the time, be provisional, and must in fact exist as advisers only of the Magistrates. The accounts would still have to be rendered in Sessions. The difference would be, that the Magistrates would have Committees to counsel and advise them to do certain acts. But the acts being still the Magistrates', they must have a veto, for the present.

17th. Before any long period elapses, the Act could be altered, if in the interim the system was found to work well, and then a Committee, and each of its Members, being recognized by Law, would be amenable to punishment for malversation or corruption in the discharge of their duty; whilst they are not, power given to them would be irresponsible.

18th. It may perhaps be asked, Why change a system that already works well? and why deprive the Conservancy branch of that unity and vigour which its administration in a single responsible hand is calculated to impart? And again, Is not this a scheme to shift the labour and attention to not very inviting details from the Magistrate, who is paid for it, to the Publick who are not?

19th. I must confess that I cannot assert that the present scheme of Conservancy management really works very well—I think it very possible that what is now done might be done cheaper, and every where defects and difficulties exist, which I despair of seeing corrected, and overcome, till the Publick themselves are thoroughly awake to the whole details of them, and have some organ for the execution of the plans they may consider most likely to attain the end in view.

20th. There is no doubt an advantage in the present unity of management. A complaint of an individual, if well founded, is transmitted to the Overseer, or other agent from the Magistrate, with celerity, and very stimulating effect; but so it would be from the Committee, in all clear and manifest cases; in more doubtful ones, the judgment of a Committee of seven would probably be more just than that of an individual.

21st. Whatever good effects the plan may have, the lessening the details of the Magistrate's labour will certainly not be one of them. As a Member of the Committee he would be expected to take a lead, and to make himself thoroughly master of all the questions discussed before it; his labour would thus be the same, at least, as now; he would have, in addition, some little trouble at times in endeavouring to reconcile conflicting opinions in the Committee, or to induce them to follow what he might think the right course.

22d. Having thus disposed of such objections to the plan as may perhaps be started against it, I will mention some of its manifest advantages.

23d. The Legislature has declared the eligibility of Natives to the office of Justice of the Peace. The Government in looking for persons worthy of holding the office as honorary unpaid Magistrates, must have experienced difficulty in selecting individuals who had distinguished themselves for unpaid services rendered to the publick. To what acts of individuals could they point (beyond the instances of Radhamadub Banerjee and Rajchunder Doss) as indications of that benevolence and publick spirit which ought to actuate aspirants to this honour? It appears to me that no better criterion could be proposed than this, that, such and such individuals, eligible in other respects, had lent themselves with zeal and fervour to the service of the publick in these Committees. They would afford a field for the display of useful qualities which now no where exists in Calcutta. In a word, they would tend in a remarkable degree, to call forth, and foster, publick spirit among the ranks of respectable Society.

24th. The Lottery Funds may now be said to be extinct for all purposes of improvement in Calcutta. The debt will be long of being paid off. The present feeling, which I conclude will gain strength, is against the morality and usefulness of Lotteries. The Savings' Bank, if prosperous, will still further cripple them. It is therefore of great importance to Calcutta that its inhabitants should begin to look after their own interests, to economise what funds they have, and to shew that they are well qualified to administer what might be granted to them, in order that those improvements which are necessary for their comfort, and the salubrity of the Town may in process of time be carried into effect. To this end, there are no means better adapted, than to organize them by degrees into properly constituted and responsible Publick Committees.

25th. There is yet another advantage incidental to the formation of a constituency of this sort, with their corresponding representations. At present there is no means of spreading among householders a knowledge of improvements connected with Conservancy purposes, adopted by individuals. These Committees would become central points for the discussion and general spread of all suggestions having for their object the promotion of the health or comfort of individuals and neighbourhoods, in as far as Conservancy matters are concerned.

26th. The last important advantage which I should anticipate from the more regular publication of the Assessment and giving the people a share in its management would be,

that the rules regulating its collection would become more perfectly known; deficiencies in collection would be more closely inquired into, defaulters would have less sympathy, when compelled to pay by process of distress; and if the right of voting were at all valued, arrears, which would destroy that right, would more seldom occur.

27th. Let no one object to this attempt at improvement and reform on the score of its humble aims. It is true that it refers to details embracing no very grand or dazzling results, but the greatest ends have often small beginnings. These simple and unobtrusive Municipal Committees may contain the germs of noble Societies, qualified to take the lead of all the surrounding country in the race of improvement.

D. M'FARLAN,
*December 1st,* 1833. *Chief Magistrate.*

P. S. The details of the arrangements for getting the votes of the inhabitants, and the amount of tax which it would be proper to fix as the criterion of voting, may be left for future consideration; and perhaps it would be proper to commence the system in one Division only, that Division would probably be the 3d, or the one contained within the Bow Bazar on the north, and Durumtollah on the south, which contains the largest population, and most of the middling class.

If the qualification for voting were fixed, in that Division, at such an amount of house property as would give a tax of Rs. 50 per annum, the constituency, if I may give it that title, would be apparently only 319 persons, of whom about 70 are Natives. If again the qualification be taken on a tax of Rs. 25 per annum, the voters would be 596, with about 132 Natives.

The former of these would be the more manageable body. The possession of the latest tax bill would be the criterion of the right of voting.

## No. 10. (B)

### LETTER. C. MACSWEEN, ESQ.

To D. M'FARLAN, ESQUIRE, *Chief Magistrate of Calcutta.*

SIR,

I am directed by the Right Honourable the Governour General in Council to acknowledge the receipt of your Letter dated the 1st instant, with its enclosures, on the subject of the expenditure incurred on the Police of Calcutta in its several branches; and proposing, as an experimental measure, that a sum equal to the average amount heretofore expended annually on the Conservancy Department be given up to the management of a Committee of the inhabitants themselves, in each of the four Divisions of the Town.

2nd. In reply, I am desired to observe, that the only fund which is by law made applicable to particular purposes is the Assessment, which has always been insufficient for those purposes, a large sum in addition having been each year sanctioned by the Government, with whom rests a discretion to limit or increase the additional sum to be disbursed from the general revenues of the State.

3rd. With a view to induce the inhabitants to take an interest in and to aid the measures adopted for their own comfort and convenience, and in the expectation that the money authorized to be disbursed will by that means be most satisfactorily and advantageously appropriated for the benefit of all concerned, his Lordship in Council is pleased to authorize you to arrange the details for the appointment of a Committee on one Division of the Town, on the plan and for the purpose described in paragraphs 15 and 16 of the Paper of "Remarks" submitted with your Letter under reply.

4th. When the details of the plan shall have been arranged and approved by Government, and the Committee appointed, the Governour General in Council will relinquish interference in the disbursement of the average amount which has been heretofore expended in the Conservancy Department of the Division, and place that sum at the disposal of the Committee.

5th. This measure will of course be considered as experimental. The operations of one year will probably enable Government to decide on the advantage of extending or discontinuing the arrangement now sanctioned.

6th. Mr. Gordon's original Minute and the private notes received with your Letter are returned, a copy of the former having been kept for record.

I am, Sir,
Your obedient humble Servant,
*(Signed)* C. MACSWEEN,
*Secretary to Government.*

COUNCIL CHAMBER,
*December 23d, 1833.*

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## No. 11.

### ADDRESS BY D. M'FARLAN, ESQ.,

*To the Owners and Occupiers of premises in Calcutta.*

In continuation of my late address to you on the subject of forming Committees for an improved management of the Conservancy Department of Calcutta, I beg now to explain more at large, the evils to which I alluded in that communication, and how Committees might be expected to effect more for the removal or alleviation of these evils than a Magistracy not so aided could hope to achieve.

I will first briefly mention those points of Conservancy management which appear to me to be in a satisfactory state; for the purpose of bringing into more prominent notice the real evils to which the inhabitants are at present subject.

The state of the Roads may, I think, be said to be satisfactory,—for the slight traffick that passes over most of them the material is, I think, well adapted and very cheap. Rupees 40,000 per annum for keeping in tolerable repair 170 miles of Road is no very heavy expense—I have heard it admitted by good judges that the main Roads are better and pleasanter to drive over than in most Towns of Europe. There are some Lanes in the Native part of the Town not yet pukha, but very few; some of these are understood to be private property. Some are so narrow that a roller cannot be turned in them, and therefore repairing them with brick khoa is often not an unmixed benefit. It would be better perhaps if Cossitollah, Bow Bazar, and Chitpore Road were paved with stone for the sake of avoiding frequent repair, but this would be much more expensive than the present system.

The next favourable point is the regularity with which the sweepings of stables and houses is removed: to persons acquainted with some European Towns, Calcutta will be allowed to be well off in the above and similar respects.

The Roads themselves are kept tolerably clear of obstructions and crowds. The inveterate Native customs of processions and of hawkers of small wares congregating in certain points are exceptions to the above statement. I am not aware however that more could be done, at all events without legislative interference than is at present accomplished.

The great evils are,

1st. The state of the publick Drains.

2nd. The state of property as containing small green and generally esteemed noxious Tanks.

3rd. The narrowness of the principal thoroughfares.

4th. Limited extent of Road Watering.

5th. Limited extent of Lighting.

Of these the most fruitful and vexatious source of annoyance is the Drains. Nothing can be more painful than to witness their state in many places, and the imperfect means at our command to clean them; they are many of them mere receptacles for filth, which filth is attempted to be emptied out of them by the hand or to be pushed on from one place to another, generating and dispersing the annoyance of abominable smell and unwholesome vapour.

Even in cases where much expense has been incurred to make efficient Drains and Tunnels the annoyance is not less perceptible—witness the Tunnel passing from Cossitollah by Waterloo Street, down Court House Street, and into the River under the Bankshall. This Drain is on the model that is generally recommended for all, and the levels are favourable; yet it is notorious that notwithstanding all the pains that can be taken to keep the Drain sweet, a most disagreeable smell rises from it, to the great annoyance of those living near it, and consequent deterioration of the value of property.

It seems indeed impossible that a Sewer such as this can be other than productive of foul smells. It must have openings in it to receive the surface water, and these openings will omit offensive smells whenever the air at the surface of the ground being colder than that in the Tunnel draws the lighter air into the atmosphere. If, as a remedy for this, we stop the apertures close, how is the surface water of showers, of baths, and other drippings to reach the Tunnel?* The only remedy, and that probably imperfect, is to send a large supply of River water through the Tunnel daily; but whence are to come the funds necessary for this? Additional assessment for the quarter benefited? This never can be tried by Government, till a majority at least of householders are sensible of the necessity, and petition for it. Without Committees and local meetings the sense of such majority will not easily be got at.

* If the foul air be kept continually pent up in it, it will be dangerous to send boys into it to clean it.

Another sort of Drain is the large pucka main Drain on the north side of the Durrumtollah,—this is not so much complained of; the drippings and partial leakage of the aqueduct that runs close to it probably help to keep it in good order—the facility with which it can be swept out is however an immense advantage—a body of River water sent through it daily would make it as perfect as the country will admit of.

If this be the state of the best sorts of Drain, what must be that of the others in crowded neighbourhoods—all with a slope approaching nearly to a level, many of them of earth only?

Major Schalch's very useful surveys of Calcutta present in the strongest light the wretchedness of its situation in this respect. The bank of the River it is well known is the highest point of the Town, and for this reason it is impossible to drain any considerable portion of the Town towards the River. Cossitollah and Clive Street form the limits of the Western Drainage, all the rest must go Eastward.

Now what the fall is in that direction, the following Memorandums explain; it being kept in mind also that this fall is not uniform but undulating,

| *Miles.length in feet.* | | *Ft.* | *In* | *L* |
|---|---|---|---|---|
| $1\frac{1}{20}$ = 5,380 | From the West end of Durrumtollah to the Circular Road, the fall is | 2 | 1 | 1 |
| $1\frac{1}{11}$ = 5,760 | From the West end of Loll Bazar at the corner of Cossitollah to the Circular Road, the fall is | 1 | 10 | 2 |
| $1\frac{1}{12}$ = 5,690 | From the West end of Mutchooa Bazar Street at its junction with Chitpore Road, the fall is | 2 | 0 | 0 |
| $1\frac{1}{16}$ = 5,598 | From the West end of Rajah Gooroo Doss Street to the Circular Road at Manicktollah, the fall is | 1 | 8 | 5 |
| $1\frac{6}{10}$ = 4,752 | From the West end of Park Street to the Circular Road the fall is, | 1 | 3 | 9 |

Such being the fall it is not wonderful (however grievous to reflect upon it) that the water of some of those Drains should have in its course to be bailed by hand to a higher level.

The only feasible general principle of Draining is to intersect the body of the Town from West to East with deep main Drains, covered or open, and lead to surface Drains from the North and South, into this line. Now these surface Drains cannot be level, they must fall toward the Tunnel or Trunk Drain, and this Drain, if a tunnel, must have depth to admit of the arch being thrown over it.

Thus of the whole fall three feet must be lost at starting, i. e. at the Western end of the Drain; then we have two feet of natural fall and seven more of excavation, the difference being a fall of six feet—to the level of the Salt Water Lake. This is the whole amount of fall in a course of a mile and upwards; sufficient no doubt to let off large bodies of rain water with considerable velocity, but wholly insufficient to lead off the slimy and glutinous substances deposited in the Drains. There these substances must remain till washed out by heavy showers or by enormously expensive artificial jets of water.

It may here be remarked, that the end for which the Drains have hitherto, in theory, been constructed, is pretty well answered. There are only two or three points on the Roads that I am aware of, which are once or twice a year subject to overflow by rain water from the insufficiency of the outlet, and that only for an hour or two;—the enormous quantity of filth they carry into the Circular Canal is almost incredible.

The construction of a Tunnel or main Drain, such as I have described, at any one point, would cost not less than 30,000 Rs., and that supposing not an inch of ground required to be purchased; the addition of appropriate surface or branch Drains have not been estimated; probably a lac of Rupees would not suffice for each Tunnel.

Where are these funds to come from, and whence the enormous expense that would be necessary to drench these Drains artificially with water? Not certainly from the general revenues of the State, but from the owners of property to be improved by it, and their tenants who are convenienced by it. But to raise these funds discussion and combination, in other words, District Committees, are necessary.

It is no object of wonder that loud complaints are made of the Drains, but with such information as I have given above before them, I should think that reflecting and sensible men would pause before they blamed the administrators of the present system.

There is one other consideration connected with this subject, viz. the poverty of a great portion of the Town. It is clear that men who can afford for themselves only a wretched straw hut for their personal shelter, cannot create an effectual demand for expensive pukha Drains.

Seeing therefore the great difficulties that belong to this subject, not only must every exertion be made to place matters on a better footing, but every palliative should be put in requisition. Among the latter, I know of none so effectual as the construction of cess-pools for the reception of the waste water* of kitchens. This expedient if extensively used in

* This waste water is the principal source of the foul smells (and it may be of malaria) that infest the drains of Calcutta.

Chowringhee and other parts not densely inhabited by the poor, would introduce an important reform in those tracts at an expense not exceeding 20 or 30 Rs. in each house. I have tried them with unmixed benefit. It is clear that under almost any circumstances these dribblings of kitchens must evaporate in the open air somewhere or other, or sink into the earth. It is surely much better to get rid of them at once by allowing them to drop into cess-pools than to allow them to infect the air and annoy the neighbourhood by leaving them to evaporate or sink into the earth close to the orifice from which they issue from the kitchen, or be driven with painful hand-washing from one door to another, annoying both inhabitants and passengers.

It has been said that these cess pools would infect the Tanks—any fear more visionary I cannot imagine. The effect of filtration we are all aware of; and judging from that, we should expect to find the contents of these cess-pools, supposing them to perforate into the strata, thoroughly purified at the distance of two or three feet from the cess-pool itself.

Supposing these cess-pools to be considered by the inhabitants to be perfectly free from danger, a very considerable benefit would be conferred by a committee of inhabitants bringing them into use by example and precept, or even by means of applying for a legislative enactment. Then the strict letter of the present Bye Law might be enforced, viz., "If any person shall throw or lay, or cause to be thrown or laid, or knowingly or intentionally shall permit to be thrown or laid, any carrion, dirt, soil, straw, or dung, or any other filth or rubbish, or annoyance whatsoever, on any of the roads, streets, ways, or publick passages, or into *any of the Drains or Sewers*, shall for every such offence forfeit the sum of ten rupees for each and every day the same shall continue, or be reported." At present to summon a gentleman's servants to trial for allowing the orifice of his kitchen to emit its waste water into the Drain would appear rather a harsh proceeding.

The evil next in the order of importance is the state of private property as containing small green and generally esteemed noxious Tanks or holes, full of water and foul vegetation.

The greatness of this evil the Magistrates are far from denying, and would willingly mend it if they could; but how is it to be done? Is the Magistrate to invade private property? Let him seize upon any given place and begin to fill up some nasty Tank—how long would it be before the process of the Supreme Court would reach him?

But supposing a law were passed to enable the Magistrate to do so, would it be just to the Native population, by whom these small and dirty Tanks are considered essential comforts, to deprive them of the use of them without remuneration? If compensation is granted in all cases, over and above the expense of filling them up, the expense of the measure it is quite plain must be enormous. Setting aside the idea of compensation, the mere expense of filling them up would be very great—earth could not be procured except by the excavation of new Tanks—for this purpose ground must be purchased—let the records of the Lottery Committee shew at what cost.

After this statement of the case in regard to the Tanks* of the Town, I should imagine that complaints against the Conservancy Department on this score would be less frequent.

* The round Tank in Middleton Street has lately been voted a nuisance, and measures are in progress to fill it up.

But let us see of what use efficient Committees would be in this matter: First, They would spread information on the subject among our Native fellow subjects, who have very insufficient ideas of the causes of malaria—and thus induce many individuals to fill up their Tanks at their own expense. Secondly, Prepare a neighbourhood to indict an obstinate proprietor for a nuisance; it not being, as far as I know, within the power of a Magistrate to do so. Thirdly, if these should fail, it would still remain for the Division Committee, if they found the matter of sufficient importance, to endeavour by means of their constituents to raise the necessary funds by voluntary assessment.

The next evil is narrow and incommodious Streets. To the northward of the line of

Writers' Buildings and Bow Bazar Road, there are but two thoroughfares that deserve the name of Roads—how are more to be made? If at all, clearly from the funds of the Town. Is it seriously believed that any existing funds or any existing Municipal bodies are equal to the undertaking of works of such magnitude? How is that splendid improvement, the Strand Road to be completed? If the inhabitants do not undertake it of themselves it never will be done; for there is too much reason to fear that the Lottery funds, even if that system of licensed play is allowed much longer to exist, will not be appropriated to such works.

I had some suggestions to make on the subject of Lighting and Watering, but I have already trespassed too long upon your time.

In conclusion I have only to say, that I am not an advocate for running hastily to additional assessments. The first and most imperative duty of Committees would be to economise thoroughly the funds which they have, and to secure for themselves all that they have a right to, if there be any such. It is idle to declaim about the right of the Publick to the proceeds of the Town Duties—let the grounds of that right (whether drawn from the analogy of Asia or Europe) be shewn, and then let the people petition for them—so also of the Abkarree Duties.

Allow me to notice cursorily some remarks that have been made on the "Proposals." It is said that they do not go far enough. It should be remembered however that the plan is confessedly an experiment—there was no call for it on the part of the people—it disappoints no expectations, for none were formed—it remains to be seen whether the people are yet ready for taking upon them the slight duty tendered to them. The Magistrates have now a fixed responsibility vested in them. Is that to be abandoned before we are sure that others will take it up? Can it be abandoned while the law remains as at present? And, lastly, though the special duty of the Committees is laid down, they may be sure that every facility will be given to their inquiries on all other subjects connected with the Police. It is only by laying a good foundation of faithful and efficient management in small matters that they can hope to build up a system embracing the whole circle of Municipal institutions. Reforms which require the agency of the people to effect them must be demanded by the people—my object is to invite, to stimulate that demand.

Your obedient Servant,
D. M'FARLAN.

## No. 12.

### LETTER ADDRESSED BY THE CHIEF MAGISTRATE

*To the Owners and Occupiers of Premises in Calcutta.*

GENTLEMEN,

Having thought it my duty to lay before Government two propositions, viz., one to levy a tax on the inhabitants of the principal thoroughfares for the purpose of defraying the charges of watering them, and another to enable you to elect Commissioners to examine into your Municipal accounts, I was naturally desirous that you should not be ignorant of matters so nearly affecting yourselves, and I accordingly applied for, and obtained the sanction of the head of the Government for the publication of the annexed Letters.

I am not aware of what may be the decision of Government on the subjects thus submitted, but conclude that it will depend a good deal upon the sentiments that you may see reason to adopt and express in regard to them.

I am, Gentlemen, your obedient Servant,

CALCUTTA,
*Police Office, March 1st,* 1835.

*Chief Magistrate.*

# No. 12. (A)

## LETTER. D. M'FARLAN, ESQ.

To W. H. MACNAGHTEN, ESQ., *Secretary to the Government of Bengal.*

SIR,

It is with some concern that I have to report to Government, that the Conservancy Committees, proposed to be instituted for the better management of that Department of the Town business in my Letter of the 1st December, 1833, have not yet been any where nominated, and that I do not at present see any immediate prospect of their being so.

2. In explanation of the steps taken by me on the subject, I have the honour to submit a few printed copies of Letters addressed by me to the inhabitants, which I trust will satisfy Government that no step that I could properly take has been neglected by me in order to stimulate the people into a little more concern for their own affairs.

3. The causes of this apparent apathy are, no doubt, the absence of any grievous evils connected with the Police, the removal of which could obviously be effected by the means of Committees—the want of idle men of talent for business—the belief that Government is bound to effect improvements—the general belief that the Funds of the Town are honestly managed—the apprehension that the Committee plan might lead to heavier taxation—the want of any known Code of Rules, pointing out the mode in which Meetings could be held, and Commissioners appointed, and their powers defined—and, lastly, the want of a sufficient personal stimulus, arising from expected honour, rank, or political influence connected with the discharge of the duty.

4. Such being the case, it might be said that Government have now only to economise the old, and to impose additional taxes, and carry proposed improvements into effect through their paid servants. I think, however, that this is a course to which Government should not resort, till hope of attaining the end, through the instrumentality of the people themselves, is exhausted.

5. By the statement I have the honour to append, it appears that Government do in point of fact expend the whole of the Town Duties upon the Police of the Town, exclusive of the pay of the Magistrates and Superintendent. I see no reason why the people should not be told distinctly that Government will not allow of a single Rupee being expended upon the Town, beyond the average annual proceeds of Assessment and Town Duties, and that it is not their intention to continue the Lotteries beyond the period when the debt is paid off. This would at once put an end to that vague dependence upon Government for the execution of every work of improvement, and the care of all publick business whatever.

6. In a separate address of this date, on the subject of Watering, a new tax is proposed to be imposed; if that be ordered, it will probably have the effect of drawing increased attention to the subject.

7. In order to remove every obstacle to the assembling of the citizens together, for the purpose of looking into and controlling their Municipal affairs, I see no reason why portions at least of a law passed for Ireland in 1828 should not be enacted here, this would obviously be only doing more effectually what was proposed to be done in December before last, as stated in Mr. Macsween's Letter of the 3d December, 1833. If the clauses remained inoperative, they could not do any harm, and would afford a commencement for more extended institutions.

8. It surely deserves consideration whether Government should not have the power of conferring local rank of some kind upon persons elected by their fellow-citizens to offices of trust under this, or any future law.

9. It is not my part to advert to the political advantages of such a course. The main ends at which I aim, are that the Municipal establishments now existing should stand well with the Publick—that the improvements or changes, of which they are susceptible, should be introduced with the knowledge and consent of the people—and that such a share of power should ultimately be entrusted to the inhabitants, as to enable them to execute, or cause the executions of the improvements they might desire to see effected.

10. So languid would appear to be the Publick appetite for business of this sort, that it would be wrong to destroy any existing establishments in order to make way, for confiding to the publick Committees the arrangement of the details of the Town business. They must at first be auditing, inquiring, and reporting Committees, with power to call for papers and accounts; to make suggestions on matters relating to expenditure of Town funds; and, finally, to petition Government in regard to any matter that might seem to call for that course.

11. Supposing the Government to adopt the above suggestions, a very important subject of inquiry with the Committees would be, whether better means of raising the sum now realised from Town duties could not be devised, provided that Government would consent to repeal the tax. This measure, it is plain, would be no sacrifice to Government, since they have for many years expended that amount on the Town, and it being a purely local tax, they ought perhaps to continue to do so.

12. In conformity with the above sentiments, I have the honour to submit a draft of an Act, to enable the householders of Calcutta to elect Municipal Commissioners with certain powers.

I have the honour to be, Sir,
Your most obedient Servant,

CALCUTTA POLICE OFFICE,
*February 5, 1835.* (*Signed*) D. M'FARLAN, *Chief Magistrate.*

## No. 12. (B)

*Statement referred to in Para. 5.*

| | | | |
|---|---|---|---|
| Establishment of Police Thannadars, Burkundazes, &c. Superintendent of Roads, and Executive Officer, with their subordinates, Overseers, &c. | 145,652 | 2 | 7 |
| Contingent Charges—Repairing Roads and Drains, Cross Bridges, &c. ... | 39,118 | 3 | 8 |
| Ditto Cleansing the Town, .. .. .. .. .. .. .. | 72,954 | 15 | 4 |
| Ditto Sundry Charges, including Thannah Rent, Scavenger's Carts, Rollers, Repairs of Buildings, Office Charges, .. .. .. .. | 12,245 | 11 | 2 |
| Establishment of Clerks, Writers, Constables, Peons, Town Guard, House of Correction, Police Hospital, and Conservancy Establishment for the Esplanade Roads, .. .. .. .. .. .. | 84,764 | 1 | 8 |
| Contingent Charges—Conveyance Allowance, Dieting Prisoners and Patients in Police Hospital, Law Charges, Office Charges, .. .. | 31,765 | 8 | 8 |
| Ditto Lighting, Watering, Paving, and Draining the Town ... .. | 41,275 | 6 | 10 |
| | 427,776 | 0 | 11 |
| Net Collections of Assessment, .. .. .. 195,799 10 9 }<br>Average amount of Town Duties, .. .. .. 216,233 8 7 } | 412,033 | 3 | 4 |
| Excess paid by Government, .. .. .. .. .. .. Rs. | 15,742 | 13 | |

(*Signed*) D. M'FARLAN, *Chief Magistrate.*

# No. 12. (c)

## DRAFT OF AN ACT.

Be it enacted that from the next the Town of Calcutta shall be considered to be divided into the four following Divisions for the purposes of this Act, viz.

1st. or Upper North Division—bounded on the North by the Mahratta Ditch, on the South by Mutchooa Bazar Road and Cotton Street to Meerbhur Ghaut, on the East by Circular Road, on the West by the River Hoogly.

2nd. or Lower North Division—bounded on the North by Mutchooa Bazar Road and Cotton Street to Meerbhur Ghaut, on the South by Boituckhanna Road and Hare Street to the Police Ghaut, on the East by the Circular Road, and on the West by the River Hoogly.

3d. or Upper South Division—bounded on the North by Boituckhanna and Bow Bazar Street to Police Ghaut, on the South by Durrumtollah Street and Esplanade Row to Chaundpaul Ghaut, on the East by the Circular Road, on the West by the River Hoogly.

4th. or Lower South Division—bounded on the North by Durrumtollah Street and Esplanade Row to Chaundpaul Ghaut, on the South by the Lower Circular Road, on the East by the Circular Road, on the West by the eastern border of the Fort Plain.

II. And be it further enacted, that upon the application of twenty-one or more householders, residing in any one of the said Divisions, and each occupying a dwelling house, or other premises, assessed under the Act of the 33d G. III. c. 52, at a monthly rent of 50 Rupees and upwards, it shall be lawful for the Governour of Bengal to order the Chief Magistrate of the Town of Calcutta or other publick officer, to convene a Meeting of the inhabitants of the Divisions, for the purpose of carrying into effect the provisions of this Act.

III. And be it further enacted, that at any meeting, convened as above directed, every person, who shall have occupied as owner or lessee, any premises of the assessed monthly value of 10 Rs. and upwards, for the period of six months antecedent to the time of such meeting, shall be entitled to vote at such meeting, and no other person whatsoever, and no person occupying any house or other premises, on which the assessment is — months in arrear, shall be entitled to vote, or take any part in the proceedings of the meeting.

IV. If any controversy shall arise at any such meeting, as to vote, such controversy shall be determined by the Chief Magistrate, or other officer appointed by the Governour to preside.

V. It shall be competent to a meeting convened as aforesaid, provided it shall be attended by one-third of the number of persons qualified to vote, to proceed to the election of no more than nine and not fewer than five of their number, owning or occupying premises of the monthly rent of 50 Rupees, and upwards, who may be willing to serve as Commissioners of Town Police for the Division. The Chief Magistrate and the Magistrates of the Divisions shall be ex-officio members of each body of Commissioners.

VI. The Commissioners so elected shall remain in office for one year, and shall be capable of being re-elected.

VII. An ordinary meeting of the inhabitants qualified to vote shall be held in the month of January of each year, to be presided at by the Chief Magistrate, or other person appointed by the Governour of Bengal.

VIII. The Commissioners of any one Division may at any time call a meeting of the Commissioners of any, or of all the other Divisions, to consider any matter of interest affecting all the Committees.

IX. The sittings of the Commissioners shall be held monthly in publick, and their duty shall for the present be confined to collecting information regarding the evils most felt by the Community that are within the province of Police to remedy, regarding the expenditure of Town funds, and the strength of the establishments maintained, and the manner in which they are employed; the mode in which new funds might be raised, and the old economized; and generally to the suggestion of improvements, and the means of executing them—and to this end they are empowered to correspond with Government through their Chairman, and to call for the production of all accounts and papers connected with the subject.

X. The Commissioners of each Division shall be at liberty to entertain a clerk at a monthly salary not exceeding Rupees 100.

## No. 13.

### LETTER. D. M'FARLAN, ESQ.

To W. H. MACNAGHTEN, ESQ. *Secretary to the Government of Bengal.*

SIR,

In continuation of my Letter of the 23d ultimo, reporting the accumulation of a sum sufficient to construct the additional Pumps and Reservoir required at Chaundpaul Ghaut for watering the Roads of the Town, I have the honour to submit the following remarks and suggestions on the subject, together with the Draft of an Enactment.

2. The plan of voluntary subscription, suggested by me on the 24th August, 1834, and sanctioned by Government on the 1st September, 1834, has been only partially successful. Subscription books were sent to every house early in November—many persons subscribed, but some of these have withdrawn, because their neighbours would not contribute; and many more were only willing to do so, if their neighbours would. Some few objected on the specifick ground, that when the Town Duties were given up to the publick, it would be time enough to talk of voluntary subscription; and some said they would submit to no new tax, till they had a controul over the old.*

3. The objection founded on want of controul over the old assessment fund is hardly chargeable on Government, and the excuse that the Town Duties are not applied to Police purposes, is not tenable; for by a statement appended to this Report, it appears that, over and above the assessment, and exclusive of Magistrates' Salaries, more than the amount of the Town Duties is already expended on Police purposes by the Government, and nothing is proposed in the present plan to be withdrawn from the Town.

4. It might here be argued that, because the bulk of the persons affected by the annoyance of dusty Roads have neither subscribed when asked, nor petitioned to compel recusants, nor complained in a publick manner, there must have been little inconvenience felt, and consequently no cause for the interference of Government, and probably this is a just conclusion;† for in the cold season, when the days are short and the dews heavy, and the weather calm, people do not suffer much; still the annoyance has been

* It is believed that many Streets were left unwatered, merely because nobody would commence the inscription of his name in the book sent round.

† I see in former times the watering of the Roads never commenced till March, and does not now in the Fort till that time.

‡ In parts of Chowringhee Road, Esplanade Row, Durrumtollah, Bow Bazar, Clive Street, Tank-Square.

considerable,‡ and must greatly increase towards the end of February, and be intolerable in March, April, and May. Yet the feeling caused by this annoyance is almost sure to escape in other ways than in a quiet business-like meeting of neighbours, to devise a remedy; and I doubt whether, even the southerly winds with their suffocating dust, would induce people to petition for a law to impose a tax, or to enable them to controul, and so attempt to save enough out of the old taxes as to pay for this additional convenience. I am indeed justified in this conclusion from the fact, that the most populous and frequented parts of the Town, such as the Bow Bazar, Clive Street, Cotton Street, Rada Bazar, China Bazar, and Hatte Khola, never have been watered at all, and no movement, that I know of, has ever taken place to cause them to be so. Such being the state of the case, the following questions occur.

(1.) Whether the old system of watering a few principal Streets at the Government (or Town) expense, leaving other parts uncared for should be recurred to?

(2.) Whether the inhabitants should be left to petition for the removal of the evil of dusty Roads, Government remaining inactive till they do so?

5. The principle involved in the first question would seem to have been decided by the Letter of the Honourable the Vice-President in Council of the 1st September, 1834, in favour of extending watering. Indeed, I think there can be little doubt on that head. Government are surely exposed to a charge of partiality if they water the European Streets and neglect the Native, thus distributing *common* Funds in aid of the rich and influential, to the neglect and detriment of the poor.

6. The second question I look upon as very important, not with reference to the amount proposed to be drawn from the people, (that is small) but with reference to the principle involved in it, viz., whether Government on the mere Report of a publick officer, and without the petition of parties interested, should proceed to exercise their power of taxation, which is assuredly the most invidious office of the Government. A strong feeling of the delicacy and difficulty of the question, in this point of view, has led me to trespass at so much length on the time of the Government.

7. Among a people better acquainted with, and more disposed to manage their own affairs, I think the above question should be answered in the negative; in Calcutta, at the present juncture, I think it should be answered in the affirmative.

8. Government is aware, from a separate address of this date, that the scheme of Conservancy Committees proposed by me on the 1st December, 1833, has not succeeded. Among the causes of failure therein assigned, is the absence in Calcutta of retired men of business, or idle men of character and talent. The pursuits of every man with talents fit for publick business are of an engrossing nature, and there is in Calcutta no reward of fame, rank, or considerable influence held out to counterbalance the sacrifice men must make, who devote much time to any other than their appropriate duties. It is not therefore very wonderful that the mere hope of a little better management of some of the most uninviting details of the Town business, should not have had the effect of calling much energy or activity into exercise. I think, however, that the imposition even of the very slight tax now proposed, may have the effect of stimulating men to a thorough investigation of their Municipal affairs, and to some progress being made in forming the materials for a Municipal constitution founded on proper principles.

9. Whatever may be the effect in this respect, it seems clear, that a fair case for imposing the tax on the great thoroughfares is made out; because, first, the evil to the publick and the inhabitants is great; second, there are no funds fairly available for the purpose of removing it, and no prospect of a movement on the part of the people to create them.

10. There are two ways in which Government might frame their law, viz. to levy an adequate money contribution, adjusted according to value of premises, or to impose a penalty on every one who did not water the road in front of his door.*

11. The former of these is the more convenient course; it ensures certainty, and regularity, and responsibility is firmly attached to the publick servants. The latter has the recommendation of possible economy to the parties, in as much as those who have a small frontage might manage to water in front of their houses by means of the servants already engaged by them. And, further, the expense would be regulated by the extent of frontage, which many may consider a better criterion than the amount of rent.

* If it is for the publick it may be said that the publick should pay, not the inhabitants of particular Streets, but many of the publick never use the watered Roads.

12. This plan, however, could only be adopted when the whole, or a majority regulating the whole, desired it; for the greatest inconvenience would be found to arise from the mixture of publick and private servants tasked to water a given extent of road, while the imposition of a penalty for neglect, would not only be invidious, but to be effectual, would require an establishment to watch the parties who agreeing to water might fail, or neglect to do so.

13. The next point is, the amount to be assessed. The statement forwarded with my Letter of the 24th August last shews a considerable variety of rate, and it would be for the interest of Streets of the low rate to maintain the list, but the principle will not bear being applied to its utmost extent, for that would lead to an assessment on each house, varying in amount according to the frontage of the premises, and the width of Street, and the having or not having an opposite neighbour; a plan neither admitting of such easy and economical adjustment, nor in itself so equitable as the assessment according to rental.

14. A general average of the expense would give about one per cent. on the annual rental, as sufficient for so much of the expense of watering as the inhabitants are now asked to pay. If the tax is levied only for the eight months the dry weather lasts, then about Rs. 1-4 per cent. for eight months would be required; this would be the better course in regard to those cases in which tenants pay tax, and the payment would be commensurate in point of time with benefit enjoyed, but greatly the more inconvenient, as causing the introduction into the account of fractions of quarterly bills. Allowing for vacancy, and per centage on collection, more than one per cent. would be necessary, but one and a half per cent. should be the limit.

15. A clause in the new enactment to enable the majority of householders in other Streets or Divisions to apply for compulsory watering would be useful.

16. The poor are evidently not much interested in this matter, all houses under 10 Rs. rent per month should be exempted.

17. The method of collecting the tax would be the same as that of the assessment, viz. by demand, through the Collector and his establishment, and process of distress, in the event of non-payment. The 2½ per cent. allowed to the Collector on assessment should be allowed here.

18. It would be well to commence the arrangement by employing the Magistrates as the administrators of the fund, and to give to householders the right to meet and appoint their own administrator, should they see fit, as well as to increase or diminish the amount to be levied at pleasure, so long as it did not exceed one and a half per cent. on the rental of houses.

19. It may be said that the present proposition is one of piecemeal legislation, and that a scheme should be chalked out which would provide for the whole expense of the Steam Engine, and of watering the Plain Roads. In the way of such a plan, however, there are difficulties not easily got over. If Government does not water the Plain Roads, nobody will;—if left to a subscription by those who use them, the same

failure as I have above described, would be incurred. The idea of a toll is not to be entertained. A general assessment all over the Town would be unjust, for the Native inhabitants of the central part of the Town do not frequent the Plain; and the great bulk are too poor to have any interest in the question beyond that of not wishing to pay any thing at all. Again, a tax on account of an engine, the benefits of which are confined to a few Streets, could never be made general.

20. The present plan may also be called piecemeal, since it leaves the item of Lighting to be paid for as heretofore out of the general funds, although the locality benefited is very limited. If Committees such as I propose are instituted, this would be a subject for early consideration; it may for the present be left in its present state, the amount expended being so small, about Rs. 5,000 per annum.

21. Upon the whole I feel justified in submitting the Draft to Government. I do not urge its adoption, because the people interested are the persons who ought to urge it. Further, I should not even have submitted it without a movement on the part of the inhabitants, did I do not think that the imposition of the tax itself will be the best inducement of the people to take an interest in their own affairs; which interest, once excited, might lead to results importantly useful.

I have the honour to be, Sir,
Your most obedient Servant,

CALCUTTA, *(Signed)* D. M'FARLAN,
*Police Office, February 5, 1835.* *Chief Magistrate.*

## No. 13. (A)

*Statement referred to in Para.* 3.

| | | | | | | |
|---|---|---|---|---|---|---|
| Establishment of Police Thanadars, Burkundazes, &c. Superintendent of Roads, Executive Officer, with their Subordinates, Overseers, &c. .. | | | | 1,45,652 | 2 | |
| Contingent Charges—Repairing Roads, Drains, and Cross Bridges. .. | | | | 39,118 | 3 | |
| Ditto Cleansing the Town ... | | | | 72,954 | 15 | |
| Ditto Sundry Charges, including Thana Rent, New Scavenger's Carts, Rollers, Repairs of Buildings, Office Charges ... | | | | 12,243 | 11 | |
| Establishment of Clerks, Writers, Constables, Summons' Peons, Town Guard, House of Correction, Police Hospital Establishment, and Conservancy Establishment for the Esplanade Road ... | | | | 84,764 | 1 | 8 |
| Contingent Charges—Conveyance Allowance, Dieting Prisoners and Patients in the Police Hospital, Law Charges, Office Charges ... ... | | | | 31,765 | 8 | 8 |
| Ditto Lighting, Watering, Paving, and Draining the Town ... | | | | 41,275 | 6 | 10 |
| | | | | 4,27,776 | 0 | 11 |
| Net Collections of Assessment | 1,95,799 | 0 | 9 | | | |
| Average Amount of Town Duties | 2,16,233 | 8 | 7 | | | |
| | | | | 4,12,033 | 3 | 4 |
| Excess paid by Government ... | | | | Rs. 15,742 | 13 | 7 |

*(Signed)* D. M'FARLAN,
*Chief Magistrate.*

## No. 13. (B)

**1832-33.**

### RECEIPTS.

| | | | |
|---|---|---|---|
| Net Collections of House Tax, 1832-33, ..... | 2,09,326 | 7 | 11 |
| Average Amount of Town Duties for ten years, viz. from 1822-23, to 1831-32, ..... | 2,19,233 | 8 | 7 |
| Net Collections of the Abkarree 1832-33, .... | 1,73,886 | 10 | 0 |
| Sicca Rupees... | 5,99,446 | 10 | 6 |

### DISBURSEMENTS.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Assessment Establishment, ................ | | | | 1,45,638 | 0 | 0 | | | |
| *Contingencies ; viz.* | | | | | | | | | |
| Repairs of Roads, ........... | 39.607 | 11 | 4 | | | | | | |
| Cleansing ditto, ............. | 79,242 | 7 | 0 | | | | | | |
| Repairs of Drains, ........... | 7,334 | 13 | 6 | | | | | | |
| Sundries, .................. | 10,766 | 10 | 1 | 1,36,951 | 9 | 11 | | | |
| | | | | | | | 2,82,589 | 9 | 11 |
| Sitting Justices, Magistrates & Supt. Salaries, | | | | 1,01,647 | 8 | 0 | | | |
| Establishment, ................................ | | | | 86,674 | 5 | 0 | | | |
| *Contingencies ; viz.* | | | | | | | | | |
| Dieting Prisoners, Conveyance Allowance, Law charges, Rewards, Office Charges, &c. | | | | 18,282 | 14 | 8 | | | |
| | | | | | | | 2,06,604 | 11 | 8 |
| *Town Duties.* | | | | | | | | | |
| Watering Roads, ....................... | | | | *25,380 | 11 | 7 | | | |
| Lighting ditto, ........................ | | | | 6,184 | 2 | 11 | | | |
| Paving ditto and constructing new Drains, .. | | | | 417 | 14 | 6 | | | |
| Sundry Charges, ...................... | | | | 1,385 | 8 | 11 | | | |
| | | | | | | | 33,368 | 5 | 11 |
| Rs. | | | | | | | 5,22,562 | 11 | 6 |

* Including the expense of the Steam Engine at Chaundpaul Ghaut, and repairs of Aqueducts.

# No. 13. (c)

## DRAFT OF AN ACT.

Be it enacted, that the several Streets of Calcutta, enumerated in Schedule A appended to this Act, shall be watered during the ordinary dry months of each year, viz. from the 15th October to the 15th June, and that for the purpose of defraying the expense thereof, an assessment, not exceeding one and a half per cent, on the valued rent of the houses in those Streets be imposed upon them, to be levied by the same persons, and in the same manner, and under the same rules, as are in force in regard to the assessment on houses, at present levied in Calcutta.

2. No number assessed at a lower rental than Rupees 10 per month, shall be subject to the payment of this tax.

3. The Streets above ordered to be watered, shall be divided into sections 1, 2, 3, 4, &c. as per Schedule A, and it shall be competent to any three inhabitants, of any one of the sections, to require the Chief Magistrate of the Town to call a meeting of the owners or occupiers of premises liable to assessment under this Act, situated within the section, which meeting, if attended by one fourth of the said owners or occupiers of premises, shall be competent to elect a committee composed of not less than three, and not more than five individuals of their number, who may be willing to accept the office, to which Committee shall belong the duty of auditing the accounts of the first year, and framing an estimate of the expense of the next and subsequent years. The members of this Committee so elected, shall remain in office one year, and shall be capable of being re-elected.

4. It shall be competent to the Governour of Bengal to order the application of this Act to any Street or Streets, consisting of fifty or more premises in the Town of Calcutta, a majority of the inhabitants of which Street or Streets, shall petition in writing, through the Chief Magistrate for the time being, for the same being extended to them.

(*Signed*) D. M'FARLAN, *Chief Magistrate.*

# No. 13. (D)

## SCHEDULE A.

*Section* 1.

Tank Square.
Old Court House Street.
Government Place.
Wellesley Place.
Council House Street.
Esplanade Row.
Old Post Office Street.
Clive Street.
Cossitollah Street.
Mission Row.
Waterloo Street.
Bankshall Street.
Coilah Ghaut Street.
Hastings Street.
Hare Street.
Church Lane.

*Section* 2.

Chowringhee Road.
Park Street as far as Wood Street.

*Section* 3.

Durromtollah Road.

*Section* 4.

Bow Bazar and Boitaconnah Street.

*Section* 5.

Strand Road from the Chaundpaul Ghaut to the New Mint.
Clive Street, Clive Street Ghaut, and Old Fort Ghaut.

(*Signed*) D. M'FARLAN, *Chief Magistrate.*

# No. 14.

## G. J. GORDON, ESQ.

*November 8th, 1833.*

### MINUTE

*On the suggestions of the Chief Magistrate for the improved Management of the Conservancy Department of Police.*

The spirit of Mr. M‘Farlan's suggestions for an improved management of Conservancy, I enter into most cordially, and therefore any remarks I offer on his Paper must be received as dictated by an earnest anxiety for the success of his Proposals, not as objections to them, on the whole as they stand.

The proper principle of election is that it should afford a true representation of the interests of every class of Society concerned. If therefore the right of voting be limited to householders paying Rupees 50 a year, and a more numerous class whose assessment amounts to a smaller annual payment be excluded, there is danger that the interests of the majority may be sacrificed to those of the minority ;—practically this sort of exclusion, the overlooking of the lower classes, has been the virtual cause of total want of accommodation for foot passengers in Calcutta, as it was formerly in Paris. The sympathies of the Road makers and conservators are engaged on the side of those who drive in wheeled carriages or are carried in palankeens. The Drains in the narrow and ill constituted parts of this Town are mere filthy ditches, both offensive and dangerous. Those on the sides of the great Streets are generally covered in, or at all events Pukha, and kept clean. In the objection to numerous assemblies of electors I fully concur ; and the way by which I would propose to reconcile difficulties—general suffrage, with order in the elections—would be to let the payers of assessment assemble by Divisions of Thannahs, and each Division elect its own Committee man, by *ballot.*

Next comes the equally important consideration of the danger of negligence from divided responsibility. To avoid this, I would make each Committee man special supervisor of his own Thannah Division ; thus would subjects of attention be distributed, responsibility individualised. I would have only one Magistrate to preside. The Chief, ex officio. The Magistrate of the *Ward* occasionally as his deputy.

I admit readily the propriety of retaining the Judicial power (for in that I comprehend both the preventative and corrective branches of Police) in the immediate controul of Government. The distinction, though not very definite, is for practical purposes, sufficiently so, between security of comfort and convenience, and security of person and property. It is much safer to leave the former to the care of the parties concerned than it would be to abandon to them the latter ; besides that protection is due by the State to each portion of its inhabitants ; whereas comforts and convenience should be provided specially by those enjoying them. Let Government therefore continue to manage the Watching of the City and the construction and repair of the adjacent Roads, but the *Lighting, Watering, Draining* and *Repairing* of Roads within the Town may be left to the inhabitants of Divisions immediately concerned.

The expenses included under the head of Assessment, and stated to be exclusive of Watching, amount to Sicca Rupees 1,62,948, while the net collections amount to Rupees 2,09,326. It is proposed, that the difference, Rupees 46,378, should be at the disposal of the respective Committees according to the contribution of their several

Wards. This is much too small an allottment for improvements; and for the reasons stated there is little probability of aid for that purpose being henceforth derived from the Town Lotteries. It would therefore be highly desirable to obtain from Government a recognition of the claim of the inhabitants to the application to Municipal purposes of the Town Duties,—a claim formerly acknowledged both by the Court of Directors and by the Local Government. Not that I approve of the tax itself, but that I would urge the justice of expending local taxes, such as are not levied indiscriminately over the whole Country, but paid exclusively by the inhabitants of a Town, on purposes beneficial, peculiarly to its inhabitants. The Abkarree I fear can scarcely be claimed on this ground, but the Licenses, Fees Fines, Escheats of Rents I think may. If called on to suggest a tax in lieu of the Town Duty, I would propose a Shop tax—it would be very unpopular amongst Shopkeepers, but there is no tax of which the incidence would be so little injurious, falling as it would in fact almost immediately on the consumer, and operating on the other hand for his benefit as a strong stimulus to competition amongst venders.

The last suggestion I would submit is, that when the plan is matured it should be extended at once over the whole of the four Divisions; partial legislation is always an evil, and there is no such broad line between the Divisions severally, as marks the separation between the institutions of Calcutta, as a whole, and the Suburbs, to indicate the selection of one part of the Town alone for this experiment. I take it for granted, that the idea of permanently restricting the operation of the plan to one District of the Town is out of the question. If it be said that difficulties may be anticipated to the beneficial operation of the arrangement in one part of the Town, which need not be apprehended in another, I say now is the time to provide against these difficulties. If there be any obvious mode of surmounting them, adopt it at once. If not, defer the execution of the plan till the whole is matured. If, for instance, the undue influence of any Native family is an object of apprehension, that may be at once got over, by having recourse to the ballot; but it will not be seemly to have open voting made the rule for one Division and the ballot for another; nor after experimenting successfully for one Division would it be convenient to alter the rules of proceeding merely from an apprehension that they might not work so well in another quarter of the Town.

*(Signed)* G. J. GORDON.

CALCUTTA,
*November 8th*, 1833.

## No. 15.

### ANSWERS BY J. R. MARTIN, ESQ.,

*April 15th*, 1838.

***To Queries put to him by the Fever Hospital and Municipal Improvement Committee.***

**Q. 1. You are Surgeon to the Native Hospital of Calcutta which the Committee have been given to understand was originally instituted and is still supported chiefly as an Hospital for Surgical cases?**

***A.*** **The Native Hospital was founded exclusively for Surgical purposes. I have been Surgeon to it for nearly eight years.**

*Q.* 2. The Committee observe by the Returns of the Hospital that the number of Medical cases admitted into it during the four years ending 1836-7 have greatly exceeded the number of Surgical, and that you state in your note to the Governours of the Hospital that you have often thought you did injury to wounds and ulcers by admitting numerous cases of fever and dysentery, but that you could not avoid it. Will you be so good as to explain the circumstances which have compelled you to admit so great a number of Medical cases?

*A.* During the four years stated, the Medical cases have greatly exceeded those of a Surgical nature, and I have no hesitation in repeating that the large numbers of cases of fever and dysentery, which we feel obliged to admit, have done, and are doing injury to our cases of operations, wounds, ulcers, and indeed all our Surgical cases; for nothing can be more injurious to a Surgical Ward than crowding. The circumstances that compel us to admit such numbers of Medical cases are the want of any other Hospital or place of relief for such cases, and the consequent certainty of death to the applicants in event of our refusing to receive them into the house.

*Q.* 3. Of what religious descriptions, Hindoos, Mussulmans, or Native Christians, and of what castes of Hindoos, and in what proportions in point of number of each description and caste, do the patients who daily apply for relief in purely Medical cases usually consist; and do they frequently or ever apply for admission into the Hospital as In-door patients in greater numbers than you can receive?

*A.* We reckon generally that there are three Hindoo applicants for every Mahomedan in both descriptions of diseases, Medical and Surgical. The Hindoo applicants are almost exclusively of the labouring classes, and of various castes. Of both religions, Hindoo and Mahomedan, we have numbers of daily applicants for In-door relief, to whom we cannot possibly afford it. These poor people are almost all suffering from diseases of a Medical nature, for severe Surgical diseases we always admit; and the slighter fevers of those latter do not require In-door Hospital management.

*Q.* 4. It appears from the returns of the Hospital that medicines and advice are given to Out-door patients in Medical as well as Surgical cases; but the numbers of each class are not distinguished. Have you the means of informing the Committee what proportions of these cases are Surgical and what Medical, or what proportion the Medical cases of Out-door patients probably bear to the Medical cases of In-door patients? and have you any means of distinguishing, with a probable approach to accuracy, in the cases of Out-door patients, the number of new applications in fresh cases from the number of renewed applications in cases of continuing disease, in which the patient has already received medicine and advice?

*A.* The proportion of Medical cases to the Surgical, amongst the Out-door applicants, may be stated on a rough estimate, at four to one: but any thing like accuracy can alone be obtained, in the very important branch of Medical statistics, through the regular diaries of an Hospital: Dispensaries do not afford such in any country. It would be very difficult if not impossible to distinguish the new applicants from the recurring ones. We have frequently fifty men of a day bearing the same name, and were any of these last questioned as to his having been a former applicant, he would be certain to suspect our motives and deny the fact.

*Q.* 5. Of those whom you receive as In-door patients what proportion usually present themselves with the intention of applying to be so received, and what proportion with the intention of only receiving relief as Out-door patients? Out of the number of patients

applying generally for relief, in what manner and by what rules do you select those you propose to retain as In-door patients? and do you find many of those you would be disposed to select reluctant to remain within the Hospital? and do you ever succeed, and in what proportion of cases; and by what persuasions; in overcoming the reluctance of those who object?

*A.* After accommodating the Surgical patients we have the remaining beds always occupied by Medical cases of an urgent nature, and these are generally persons who either solicited In-door relief directly or applied as Out-patients in the first instances, but took to bed on being told that their diseases required In-door management. The demands on us for In-door relief are so much beyond our means to answer them, that we are not very often troubled to over persuade patients to remain in the house; but such cases do occur occasionally, and then we point out to the Natives how all their religious observances are attended to, and that the establishment is furnished with Brahmin and Mahomedan cooks. I succeeded in keeping an old Brahmin in the Hospital lately during a whole month by such arguments, and he left us quite satisfied with his treatment in every respect. Several persons in course of a month positively refuse to remain as In-patients, and of all classes of Hindoos the Orissa bearers are those of most rooted prejudices; generally here, as in the army, the lower the caste the greater the difficulties offered to Medical management, and vice versa.

*Q.* 6. From your knowledge of the character of the Natives of this part of India, and your Medical experience among them, are you able to form an opinion whether there exists among them a very general and rooted dislike, or any material dislike, to the receiving advice and taking medicines from European Medical practitioners when they are labouring under acute or chronick diseases requiring Medical treatment alone?

*A.* I have never seen any thing of the kind on an extended scale, but quite the contrary. Instances will now and then occur, where the poorer Natives are induced to place confidence in their empiricks; on these failing in their promises of a speedy cure, however, the poor people always come to us, and we have thus presented to us the lamentable ravages produced by the favourite preparations of arsenic and mercury in daily use amongst the Native doctors. Such is the confidence of those Natives who have opportunities of observing the relative advantages of their own and our plan of treatment, that they will always apply for medicines even to Christian ladies and gentlemen in preference to their own doctors. The intelligence common to every Christian they consider of more value than the boasted knowledge of the empiricks.

*Q.* 7. Do you believe that any such general and rooted dislike to the entering an European Hospital as In-door patients, when they are labouring under dangerous acute diseases requiring Medical treatment alone, exists among them, that a well constructed Hospital erected in a centrical part of Calcutta, capable of receiving 250 patients, provided with all the necessaries for the cure or relief and for the comfort of the patients afforded by a well regulated Hospital, adapted to the customs of the country, and prejudices of religion or caste, and under the immediate superintendence of a well instructed and prudent European Apothecary, and the daily inspection, controul, and Medical direction of a skilful and considerate European Physician well acquainted with the Native customs, prejudices, and manners, would fail to attract upon its first establishment a sufficient number of Native patients in Calcutta and its Suburbs, whether Hindoos, Mussulmans, or Christians, to confer upon it a degree of usefulness, commensurate to its size, and to the expense at which it would be erected and maintained? And if you think it would so fail, to what extent do you think a smaller Hospital would succeed, or several,

and how many of such smaller Hospitals? And upon what grounds do you entertain your opinion; and of what religious castes would the patients chiefly consist?

*A.* So far am I from believing in the general existence of any such prejudice, that I will engage to fill a well ordered Hospital, such as that mentioned, and what is more, I will keep it full, by transferring to it the daily applicants for In-door relief of the Native Hospital for whom we have not accommodation. Such an Institution as that contemplated is one of necessity to the Natives, and I am satisfied its value would be duly estimated even by the poorest of the inhabitants of Calcutta; for it is only those of the Natives who are too far removed from personal knowledge of Europeans that can, through their ignorance, mistake the relative value of the two modes of relief in sickness—theirs and ours. Their confidence in the European management in the ordinary affairs of life is known to be very great, and I have never been in any part of India wherein the same confidence was not readily yielded to our Medical management. Even in Orissa, where I have said that prejudices are of unusual force, I was on my first arrival in the country consulted by hundreds, and that under the disturbing circumstances incident to active Military operations in the District. In respect to small Hospitals they could have no points of preference in the estimation of the Natives, but quite the contrary, as not admitting of suitable Divisions for the several castes, and separate Wards for Hindoos and Mahomedans.

*Q.* 8. If you are of opinion that such larger Hospital would fail upon its first establishment to attract such sufficient number of patients as above mentioned, are you of opinion that such sufficient number might be reckoned upon with any, and with what, degree of certainty at any, and at what, reasonably short distance of time after its establishment?

*A.* I believe that a well regulated Institution for the treatment of the diseases incident to the climate would at once be filled, and that it would continue to be so at all times and seasons; indeed, it was that belief, and the observation of the numbers daily dismissed from the Native Hospital, for whom we had no place, that formed the ground of my original suggestion to the Governours of establishing a Fever Hospital within this City.

*Q.* 9. Is the degree of reluctance to the entering a Medical Hospital felt by the Natives of India inhabiting Calcutta and its Suburbs in your opinion founded upon religious opinions, or in the case of Hindoos upon the prejudices and usages of caste, or upon feelings, prejudices, and fears common to the ignorant and the vulgar in all countries? And are you of opinion that they prevail in a greater, or in how much greater, a degree of intensity, among the Native population of Calcutta, than they have been found to prevail in among the populace in England or Scotland upon the first erection of an Hospital for the reception of Medical patients? And is it your belief that they are less likely to yield to the experience of the benefits derived from such an Hospital in Calcutta than they have been found to be in those countries, and in what degree less likely so to yield?

*A.* There are prejudices of both kinds, but those of caste are not difficult to be overcome; the prejudices common to the ignorant vulgar in all countries are of great force amongst the Natives, and they dislike the removal from their families; but all these are in general to be overcome also by kindness of manner, and the ready permission to the sick of being visited, or even attended, by their relations. The poorer Natives have not prejudices in a greater degree than I have seen exhibited in different parts of the British empire, and I feel confident such as do exist will very readily yield, here as elsewhere, to judicious management.

*Q.* 10. It is in evidence before the Committee that the most unhealthy season of the year is from August to November; do you concur in this opinion? Do you find the applications for relief in Medical cases at the Hospital more numerous during these months, and do you know any part of the year, during which the labouring Native poor of Calcutta and its Suburbs are free from the general prevalence of disease among them, or during which the daily applications for Medical relief, or for admission into the Hospital as In-door patients, are so few as not to fill, or nearly fill, an Hospital of the dimensions which have been mentioned?

*A.* Since the foundation of Calcutta, and its occupation by the British, the period from August to November has been remarked as the most unhealthy, and the observation is true to this day. I have already said that any thing like statistical accuracy is not to be obtained from Dispensary records; but the accompanying table will shew that the total applicants for Out-door relief are nearly equal throughout every month of the year, and have been so during six years. As In-door patients our worst cases of acute remittent fever and dysentery are admitted from the beginning of July to the end of October, then come the sequelæ of these two acute diseases amongst the large class who obtain no relief either in the first or consecutive illnesses, namely, intermittent fevers, enlargements of the spleen, diarrhœa, dropsy, and various forms of dyspepsia. These diseases are all seriously aggravated by the cold season. The season, when both Natives and Europeans suffer least from disease, is that from the beginning of February to the setting in of the rains; but even then the largest Hospital could be filled with the sick poor, for they can only be said, even in this favourable season, to be relieved in some degree from suffering, in consequence of the equable determination to the surface of the body occasioned by the increasing and dry heat.

J. R. MARTIN.

CALCUTTA,
*April 15th*, 1838.

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## No. 16.

To THE HONOURABLE SIR J. P. GRANT,
*Chairman to the General Committee.*

DEAR SIR,

Having made as brief replies as possible to your queries, I do myself the honour in reference to the conversation I had with you yesterday, to state in general terms that, however valuable to the sick and neglected poor of this City will prove such an Institution as the one contemplated, it is yet more on the great measures of prevention of disease comprehended in the proposed local improvements of the Suburbs and City, that we must depend; encouraged by the great truth, that here, as in all countries, it is man himself that makes his climate. So satisfied am I of this, that, on a careful consideration of the subject of Medical Topography as applied to other countries, as well as from all I know of the history of this City, and of the health of the British residents in it, from the earliest times to the present, I feel assured that, by carrying out our measures of improvement, we shall in a few years render the value of European life in Calcutta very nearly on a par with that of London, as far as endemick influences are concerned. Though I have stated the expectation of great results as affecting the endemick sources of disease, I must not be supposed to view our case as helpless even in the instance of epidemicks, hitherto the sources of great mortality in this City. Far from it: even epidemicks, though we cannot prevent their visitations, are greatly modified by states of locality; and they are found in all countries to fasten *with peculiar tenacity, and remain longest* in such localities as are neglected. Why is it

we have not now, as formerly, those "most fatal fevers, as of 1757, which swept off 800 Europeans and 50,000 Blacks." It is to the same cause, to which modern London owes its exemption from its former deadly agues, that we owe the comparative mildness of our present epidemicks; and it is a great satisfaction to know, that, though we cannot prevent epidemick visitations, we are yet able to mitigate their force, by the very same means which are known entirely to root out the endemick sources of unhealthiness in intertropical and others climates.

Yours truly,

J. R. MARTIN.

CALCUTTA,
*April 15th*, 1838.

## No. 16 (A)

*Return of the number of Out-Door-Applicants at the Native Hospital in each Month during the Six Years ending August 31st*, 1837.

| Months. | 1831-2 | 1832-3 | 1833-4 | 1834-5 | 1835-6 | 1836-7 | Grand Total of the Months |
|---|---|---|---|---|---|---|---|
| September .... | 6646 | 7371 | 8049 | 6420 | 5404 | 6631 | 40521 |
| October ...... | 6076 | 6745 | 7235 | 6020 | 5566 | 7216 | 38858 |
| November .... | 6611 | 7885 | 7689 | 6128 | 6735 | 6265 | 41313 |
| December .... | 6451 | 6828 | 6556 | 5495 | 6188 | 5862 | 37380 |
| January ..... | 6536 | 6165 | 6430 | 5892 | 5661 | 5693 | 36377 |
| February ..... | 6200 | 6561 | 6401 | 4880 | 5898 | 5793 | 35733 |
| March ....... | 8118 | 7627 | 7872 | 6476 | 6481 | 6280 | 42854 |
| April ........ | 7274 | 6944 | 6955 | 5804 | 6351 | 5826 | 39154 |
| May ........ | 7181 | 6155 | 6170 | 6144 | 6909 | 6257 | 38819 |
| June ........ | 5608 | 7136 | 5805 | 5984 | 6960 | 5728 | 37221 |
| July ........ | 7044 | 8072 | 6474 | 7146 | 6525 | 6915 | 42176 |
| August ...... | 5700 | 8194 | 5746 | 5991 | 6603 | 7214 | 39448 |
| | 79448 | 85683 | 81382 | 72380 | 75281 | 75680 | 469854 |

The explanation I would offer on the fact of one of the healthiest months of the year, March, being the one exhibiting the largest number of applicants, is this—During the rains, and the drying process of the soil immediately subsequent, the Bengallees are kept in their huts by the force of acute disease: in the cold season, they are sufferers in perhaps a severer degree from internal congestions, the result of the total drying up of the surface of the body. They are seen in hundreds exposing themselves to the sun, as a means of relieving the benumbing effects of the cold damp nights. During the increasing temperature again of February, March, and April, the equable determination to the surface relieves the tumid spleens, and other iternal congestions, and restores suppleness to their rigid limbs. It is thus I would account for our having the greatest number of applicants during the healthiest season; and, if I am correct in my opinion as to the cause of the apparent anomaly, it affords a melancholy view of the state of Native health throughout the year.

It would appear that the poorer classes suffer in nearly the same numbers at all seasons, and that the only important difference consists in the greater intensity of the diseases of one season as compared to those of another.

J. R. MARTIN.

NATIVE HOSPITAL,
*April 15th*, 1838.

# No. 17.

## ANSWERS BY MR. P. O'BRIEN,

*April 15th*, 1838,

*To Queries put to him by the Fever Hospital and Municipal Improvement Committee.*

*Q.* 1. You are First Assistant to the Native Hospital of Calcutta, which the Committee have been given to understand was originally instituted and is still supported chiefly as an Hospital for Surgical cases?

*A.* I am First Assistant in the Calcutta Native Hospital, which Institution was first established, I believe, principally for Surgical cases. I was appointed in July, 1833.

*Q.* 2. The Committee observe by the Returns of the Hospital that the number of Medical cases admitted into it during the four years ending 1836-7, have greatly exceeded the number of Surgical. Will you be so good as to explain the circumstances which have compelled the admission of so great a number of Medical cases?

*A.* The greater part of the House-patients have been Medical cases since I was appointed to the Hospital, which although avowedly for Surgical purposes, feelings of humanity induced us to appropriate our spare beds to Medical cases, by which means we have saved hundreds of lives annually: to have sent away poor creatures, labouring under fever, and other acute diseases, would have been to consign them to lingering disease, misery, and certain death.

*Q.* 3. [This and the following Queries are the same as those of the same date put to Mr. Martin, immediately preceding.]

*A.* Hindoos, Mahomedans, and Christians of all denominations, Jews, Chinese, and Burmese apply for treatment as Out-door patients; the Hindoos, Mahomedans, and Christians frequently apply for admission; the Jews, Chinese, and Burmese seldom; the Hindoos and Mahomedans apply for In-door relief in greater numbers than we can accommodate.

*Q.* 4.

*A.* This question I cannot answer with precision.

*Q.* 5.

*A.* Of those whom we receive as In-door patients, about three or four per cent out of the daily applicants ask for admission, the remainder come for Dispensary relief. Out of the number applying for In-door relief I select first the Surgical cases, (slight cases of venereal and eruptions excepted) next I select the cases of acute and dangerous disease; chronick cases are rejected, and of these rheumatisms are the most numerous. Men who know the Institution, and particularly old patients, are always glad to be admitted; strangers and people from the country are at first reluctant to enter the Hospital, but are often induced to remain by our representing to them the comfort, cleanliness, and good diet, cooked by one of their own caste, constant Medical attendance, a fair prospect of getting cured of their diseases by remaining in Hospital, and all without cost to themselves. In Surgical cases, let the operation be capital or simple, the patient's permission and concurrence is always obtained before a knife or lancet touches his skin.

*Q.* 6.

*A.* From what I know of the Natives of Bengal, I am sure that they will always avail themselves of European advice and medicine when within their reach; and if a Medical

man will listen patiently to them and their ideas of the causes of their diseases, its history, &c. and answer a score of foolish questions (very important ones however in the estimation of the Native) the Medical man will have more patients than he can find time to attend to.

Q. 7.

*A.* There is a dislike on the part of the people of every country to enter an Hospital, even the British soldier is very *frequently forced* into his own Regimental Hospital, where he has been cured perhaps twenty times before, and who is personally acquainted with the Surgeon and every attendant in the Hospital: with a knowledge of this fact there can be no wonder that the Bengallee will be reluctant to enter an Hospital, till forced by the severity of his disease, or the persuasion of his friends. I think that a large Hospital containing 100 beds, might be filled within two months, if placed under the management of an Apothecary and the superintendence of a Physician, both to be well acquainted with the habits of the Natives, their mode of thinking, and their *language*; to the Apothecary these are a *sine qua non*. The only dislike to entering the Native Hospital, that Hindoos of high caste have, is that they are mixed up with the Mahomedan patients; and I am sure that if in the proposed Hospital, the Wards for Hindoos and Mussulmen are made perfectly distinct, and the Hindoo part of the building divided into two or three Wards, so as to have the Brahmins, Koites, &c. separate from the Cowrah, Chumar, Doosaud, Dhobie, &c. the highest caste Brahmin would have no objection to remain in an Hospital so regulated. If there be a Ward for Christians it must also be made perfectly distinct from the apartments of the other two classes of patients; but all may be allowed to mingle freely during their evening and morning walks, but one caste should not enter the apartments of the other. The patients would chiefly consist of Hindoos and Mahomedans.

Q. 8.

*A.* No Hospital has ever been filled on its first establishment; for the first twelve months after founding the Native Hospital there were only,

| | |
|---|---|
| House Patients | 115 |
| Dispensary Do. | 101 |

As European medicine and Surgery got into repute, the number of patients increased; and in 1837, in the same Hospital, without any increase of accommodation, there were

| | |
|---|---|
| House Patients | 956 |
| Dispensary Do. | 75680 |

An Hospital containing 250 beds ought to be filled in less than twelve months, provided it be of good repute, and those who conduct it stand high in the estimation of the Native Community.

Q. 9.

*A.* For an answer to this, *vide* Question, No. 7.

Q. 10.

*A.* I am of opinion that August and September are the most unhealthy months in the year; the daily number of applicants at the Native Hospital do not vary much through the whole year.

P. O'BRIEN.

# No. 18.

*Additional Questions to which Answers are requested by the Fever Hospital and Municipal Committee from*

J. R. MARTIN, ESQ.,

*Surgeon to the Native Hospital.*

*With Mr. Martin's Answers thereto April 18th, 1838.*

*Q.* 1. Modoosoodun Goopto, Pundit of the Medical College, stated in his evidence before the first Sub-Committee on the 29th May, 1837, that the most unhealthy season of the year in Calcutta is the four months from August to November, during which the people suffer under intermittent, remittent, and bilious fevers, and dysentery, and cholera. And he also stated his belief that about 500 persons in each Thannah at an average, making in all—there being 36 Thannahs—about 18,000 persons, suffer under these diseases during the above four months. From your acquaintance with the state of disease among the Native poor of Calcutta, through your connection with the Native Hospital or otherwise, have you the means of judging of the correctness of this description, and the approach of this calculation to a probable estimate, and what is your opinion of them in these respects?

*A.* It is impossible to arrive at any thing like exactness, from the absence of all statistical information; but, judging from the known effects of our climate on health, and from the ascertained amount of the population of this City, I should say the estimate is considerably under the actual amount of sick poor.

*Q.* 2. Are you of opinion that these diseases, or any, and which of them, continue, though in a less degree, during the next four months, of December, January, February, and March. To what extent in point of number, and with what proportional degree of intensity, and average number of deaths, during these four last mentioned months, do these diseases or any of them continue to operate?

*A.* Intermittent fevers, spleen diseases, diarrhœas, and dropsies prevail much during the months of November, December, and January: many of these are the results of remittent fevers contracted during the previous rainy season. The number of deaths may be estimated at something more than one-third of all those labouring under the sequelæ of acute disease here mentioned. The number destroyed by the previous acute diseases must be very great, but we have no means of ascertaining them.

*Q.* 3. He also stated in his evidence before the Second Sub-Committee, on the 27th February, 1837, that bilious, remittent, and intermittent fevers are the most prevalent diseases among the Natives in Calcutta, and that these fevers, except the intermittent, are dangerous to life, and certain to be fatal if not attended to medically. Do you think this statement correct, and are you of opinion that the much larger proportion of fevers prevalent from August to November are of the intermittent kind, and consequently less dangerous to life?

*A.* Gastric remittent fevers, commonly called bilious, are very common and very fatal amongst the Natives. The intermittent form of fever is also very common, and, though not primarily fatal, it is so on a large scale consecutively, by founding organick disease of the spleen, diarrhœa, and dropsy.

*Q.* 4. Of the number of the poor, suffering under remittent and bilious fevers during the period from August to November, what proportion in your opinion escape with life; and what proportion do the remittent and bilious fevers bear to the intermittent?

*A.* I cannot answer the first part of this question. During the season stated, the remittent fevers are far the more prevalent: after that, the intermittents, either as idiopathick diseases, or as sequelæ to the remittent fevers.

*Q.* 5. He has said in his evidence before the Second Sub-Committee of the above date, that dysentery is always dangerous; do you agree in this opinion? Of the number of the poor, suffering under dysentery during the period from August to November, what proportion in your opinion escape with life; and what proportion do the dysenteries bear to the intermittent fevers?

*A.* Dysentery is ever a disease of danger: and when not treated, a very large proportion of the sufferers must die. The proportion of the one disease to the other I have no means of judging of.

Q. 6. He has said in his evidence before the Second Sub-Committee of the above date that the intermittent fever produces diarrhœa, and if attended with diarrhœa almost always produces an enlargement of the spleen;* that the diarrhœa following intermittent fever is generally fatal if not medically attended to, and that the enlargement of the spleen, though not generally fatal of itself, produces, if not cured, dyspepsia, œdematous swellings of the legs and hands and loins, and anasarcha, which are fatal. Are you of this opinion, and do these consequences of the intermittent fever of the period from August to November prevail during the next four months among those who have escaped with life? What proportion of them are so affected during the months from December to March? In what proportion do you believe they die, or survive only to fall victims at a later period? And are you of opinion that any of them entirely recover without Medical assistance, or with such Medical assistance as they can command?

*A.* In the Native, the diarrhœa following intermittent fever, whether accompanied by tumid spleen or not, is a disease very intractable in its nature, and I believe very fatal amongst the poorer classes; so much so, that few can survive it without careful Medical management.

* The witness on his subsequent Examination on 14th May, (inf. p. 80.) corrected this description of his former evidence, which it appears is erroneously printed. It ought to stand, "that the intermittent fever generally produces diarrhœa, and if not attended with diarrhœa almost always produces an enlargement of the spleen.

*Q.* 7. During the remaining four months of the year, from April to July, do these diseases of intermittent, remittent, and bilious fevers, and dysentery, and cholera, or the diseases which are the consequences of the said diseases, prevail, and with what degree of intensity, and with what proportion of mortality?

*A.* These are the healthiest months, and the diseases of the Natives are mitigated, as mentioned in my replies of the 15th instant.

*Q.* 8. Upon his examination, as above mentioned, by the First Sub-Committee, he stated that the persons, afflicted with the diseases mentioned in the most unhealthy season of the year, are confined to bed for the time the fever lasts. The Committee understand this to mean with the exception of intermittent fever, and to be confined to remittent and bilious fevers, and dysentery, and cholera. Are you of this opinion? In these last mentioned cases is it possible to administer relief, with any probable chance of saving the patient's life, from a Dispensary for distribution of medicines only? Or is there any other probable way of saving the patient's life than either by his removal to an Hospital, or to a Dispensary with beds, which is in truth a small Hospital, where he may receive skilful treatment and care, or by his being attended at his own house during the continuance of the disease by a skilful Medical practitioner? And how frequent ought the visits of such practitioner usually to be?

*A.* To do any good in acute disease, the patient must be removed to a large well ordered Hospital, devoted exclusively to its proper purposes, and having separate Wards for Hindoos and Mahomedans. The union of a Dispensary to an Hospital, and especially a Medical one, is highly injurious, as tending continually to interfere with the regular and due discharge of the duties required for the case of the In-door sick; and this disadvantage we labour under in some degree at the Native Hospital. To perform the

duties of a Medical Ward requires, twice every day, great care and minute attention. Each patient must be examined, and the result entered in the Diary—namely, the condition of the circulation, of the respiration, of the skin, that of the secretions, the results of medicine, &c. with directions for diet and further medicine, &c. If all this is to be done, and to do the patients common justice it must be done twice a day, how, without a double establishment, can these and the duties of a Dispensary for three hundred Out-patients per day be attended to? I would advocate Dispensaries, as highly useful establishments, but, on every account, I would confine both them and Hospitals to their proper offices. Dispensaries with beds, or small Hospitals with Dispensaries attached, can have nothing, that I know of, to recommend them, and I believe I have more than once stated my reasons for so thinking. No Medical man, that I am acquainted with, has any experience of such kind of institution. Attendance on the sick poor in their own houses would require some hundreds of Medical officers, European and Native.

*Q.* 9. In cases of intermittent fever, can material relief be afforded from Dispensaries, by the distribution of medicines and advice, given at the Dispensary only, to such as can present themselves there, or send to receive them? Do intermittent fevers constitute the great majority, and by how much the majority, of the fevers of this place? and do not many of the intermittent fevers follow as consequences upon remittent fevers? and would they not be greatly lessened in number by effecting a more perfect cure, and in a greater number of cases, of remittent and bilious fever?

*A.* Remittents are more frequent during the months from June to November, and the survivors from them are very generally afflicted with intermittent fevers. Doubtless the removal of the first would lessen the frequency of these last; but I look upon it that both are best combated by the preventive measures of local improvement now in contemplation. We shall then only have to treat medically with such cases as are inevitable. Dispensaries can afford considerable Medical relief in cases of mild intermittents; but they are wanting in the great measure of relief attendant on a removal of the patient to a good locality and house from such as are bad.

*Q.* 10. How many Native Doctors or Apothecaries are you of opinion could now be found in Calcutta, of sufficient Medical knowledge and discretion to be trusted alone with the resident superintendence of an Hospital with twenty beds or more, for the treatment of patients labouring under remittent and bilious fevers, and dysentery, under the advice and directions once or twice in a day of a visiting European Physician? And how many of such qualified Native Doctors or Apothecaries could be found in Calcutta to visit and prescribe for patients, labouring under such fevers and dysenteries, at their own houses, under such advice and instruction only as they might obtain from an European Physician, upon a daily report of the progress of disease or cure in the cases under their care, with safety to the life of the patient, and with a reasonable prospect of cure?

*A.* There are no disposable Apothecaries, and no sufficiently educated Native Doctors, according to the report of the Professors of the Medical College; nor will there be for some time to come; as the practical part of the education of the pupils, or that obtained in an Hospital, can scarcely be said to have begun.

*Q.* 11. Supposing a sufficient number of Dispensaries with beds, or small Hospitals, to be established upon such different sites, and at such distances from each other, in Calcutta, as that every populous neighbourhood should have one of them within reach of the inhabitants when attacked by acute disease, are you of opinion that one well instructed and active

European Apothecary could superintend, with the necessary degree and constancy of care, more than one of these small Hospitals, the said Apothecary having no other assistance than one Native Doctor or Apothecary, of such skill and discretion as can be obtained here in the present state of Native Medical skill and acquirements, attached to each small Hospital and residing in it? And if you are of opinion in the affirmative, how many of such small Hospitals do you think one such European Apothecary could superintend; at what distances from each other; containing how many patients in each; and with what degree of safety to the patients, and reasonable hope of cure, in those descriptions of acute and rapid disease which are prevalent in this country?

*A.* The management of sixty cases of acute disease is found as much as a resident Surgeon of an Hospital can well effect. If called on to conduct the care of two Institutions, however near, he could not well manage more than forty patients, or twenty in each. A moderate establishment, concentrated in one building, can perform duties that four times the number will not accomplish, if the buildings be divided, or at a distance from each other.

*Q.* 12. Are you of opinion that one Surgeon of the establishment, or one Physician of established reputation, and sufficient experience, from long standing, of the acute diseases prevalent in this country to give him the desirable facility in prescribing, could undertake the Medical charge and supervision of more than one of such small Hospitals? and if so, of how many, at what distances from each other, and containing how many patients in each; without diverting more of his time than he could afford from his professorial duties if a Professor of the Medical College, or from his private practice if practising as a Physician or Surgeon in Calcutta, and without risk to the safety of the patients in such Hospitals, or diminution of a reasonable hope of cure, in those descriptions of acute and rapid disease which are prevalent in this country?

*A.* In my last reply I have spoken to this point. The general supervision of an Hospital, and the time required for the duty, are so well stated in the notes of Dr. Macleod, Inspector General, that I shall not venture to add to what he has so ably described. I therefore beg to refer the Chairman and Committee to what Dr. Macleod has said on that head.

*Q.* 13. If it were determined to erect a sufficient number of such small Hospitals, so placed as to answer the purpose above mentioned, are you of opinion that a sufficient number of healthy and eligible sites could be found in Calcutta for such number of Hospitals so situated?

*A.* In the present state of Calcutta there are not to be found a sufficient number of eligible sites for such purposes.

*Q.* 14. Are you of opinion that the localities in which the vast majority, if not the whole, of the huts of the poor of Calcutta are situated, and the insufficient protection afforded against the influences and changes of the weather by their structure, present serious obstacles to the cure of those who inhabit them when seized with acute disease, although they are accustomed to the inconveniences of such locality and structure? And would it be, in your opinion, material, and if so, in what degree material, to their cure, to remove them to a dwelling better placed and constructed, where they may remain till the termination of the disease?

*A.* The condition of the localities, and the ill construction of the Native huts, form almost insuperable obstacles to the cure of the sick who are confined to them; and I should consider the first measure of Medical management, both as to time and importance, to be the removal of the sick poor from their miserable huts and worse localities.

*Q.* 15. If it should be resolved to erect several such Dispensaries with beds, or small Hospitals, as are above mentioned, would it be necessary, in your opinion, to their affording a reasonable hope of preserving the lives, or perfecting the cure, of such patients, labouring under the acute diseases of the country, as may be placed in them, that the apartments of the patients, or the Wards, should be raised a considerable height from the ground ; the walls of brick ; and the walls and roof of substantial structure ; the apartments well ventilated ; the site dry and airy ; and the house provided with the accommodations considered medically necessary for the patients in other Hospitals?

*A.* All that is described in the question is necessary wherever sick persons are called upon to sleep, or receive Medical treatment. Without all these conditions an Hospital, whether large or small, will never yield satisfactory results.

*Q.* 16 You have said that from want of statistical and Medical Records, or other means of ascertaining the facts with accuracy, you are unable to state the proportion which the number of cases of intermittent fever, among the poor Native inhabitants of Calcutta and the Suburbs, bears to the remittent fevers, dysenteries, and other acute diseases, during either the most unhealthy months, or the other parts of the year. From your knowledge of the effects of this climate and locality generally, and also during particular seasons of the year, and reasoning from your Medical knowledge and experience generally, are you able to form an opinion of what the probable proportions may be taken to be, without the risk of any violent or important deviation from the truth?

*A.* Without any violent deviation from probable approximation to truth, and judging from my experience of the climate and seasons generally, I should say that during the rainy season, or from the beginning of July to the end of October, the proportions of remittent fever and dysentery may be said to be equal or nearly so, intermittents being uncommon, or in very small proportion during that season. During the cold season, on the other hand, intermittents and diarrhœas nearly exclude the diseases of the rainy season. There is a continued form of fever peculiar to the cold season also, which, when neglected, assumes many of the characters of European Typhus, and is then frequently fatal.

*Q.* 17. Reasoning in the same way, and aiming at probability only, are you able to say what proportion the number of cases of acute disease during the eight remaining months of the year bear to those of the four most unhealthy months, and which have been stated by Modoosoodun Goopto at 18,000?

*A.* I am not able to answer this question with any thing like an approach to correctness. My opinion is, that the number of acute cases during the eight remaining months far exceeds that stated by Modoosoodun Goopto as occurring during the rains.

*Q.* 18. In a well regulated Hospital for the reception of cases of acute disease only, exclusive of intermittent fever, during how many days are you of opinion each patient on the average would remain in the Hospital under cure ; and, if it contained 200 beds, how many patients would it be capable of receiving, and retaining till the termination of the disease, during the year?

*A.* Allowing an average of ten days for the cure of each case (many would be cured in from three to six days) such an Hospital would receive and discharge in each month a total of 600 patients, making an annual grand total of 7200 individuals treated. Severe cases of intermittent fever ought to be treated in Hospital: they do not admit of speedy or certain cure without.

J. R. MARTIN.

NATIVE HOSPITAL,
*April 18th*, 1838.

## No. 19.

ANSWERS BY DR. STEWART,—*April 30th*, 1838,

*To the same Additional Questions to which Answers were requested from Mr. Martin, by the Fever Hospital and Municipal Committee.*

*Q.* 1.

*A.* Cholera is not the *epidemick* of autumn: fevers of a periodick type are, both in Bengal and other flat and swampy climates, tropical or not. I cannot offer any estimate as to rates of these in Calcutta.

*Q.* 2.

*A.* Cholera, if it has appeared at the time of changing season, declines. Fevers assume a continued type, and are characterised by more acute and local derangements.

*Q.* 3.

*A.* All diseases attended with fever, or consequent on fever at these times, have a periodick character, but are not on that account less dangerous, or fatal.

*Q.* 4.

*A.* These fevers in Bengal are very fatal, and all characterised more or less distinctly by *periodicity*. They are less fatal in proportion as the remission or intermission is greater, and medicines called *anti-periodick* are duly administered or otherwise.

*Q.* 5.

*A.* Dysentery is the most fatal, and I think the most general epidemick of the autumn months in Calcutta.

*Q.* 6.

*A.* I think there is a little confusion in his sequences, and perhaps obscurity in his account of them. None escape these consequences except those strictly treated during the fever. All the cold weather dysenteries have had their origin thus; and the most fatal are those which have been longest neglected. Of those who survive, none recover perfectly without Medical assistance and discipline.

*Q.* 7.

*A.* Dysentery and cholera prevail occasionally with violence at this time, but in a different form; not as the consequence of previous fever, but primarily and in an acute and perhaps more manageable form.

*Q.* 8.

*A.* Infinite good is and may be done by Dispensary medicine in cases of intermittent fever, because during the intervals the patient is comparatively well and able to attend the Dispensary, but remittent bilious fever in poor Natives can be treated only in an Hospital; for among such a people "angels' visits," although frequent, would not suffice to prevent commission of errors, or to compel observance of restraint, or adherence to the Doctor's instructions.

*Q.* 9.

*A.* Doubtless relief is there given and attainable among intelligent people. This is a very interesting inquiry, to which I have in vain directed my attention. I believe that fevers do pass from one type into another as described, in their progress to cure frequently.

*Q.* 10.

*A.* I have no idea. I know of none.

*Q.* 11.

*A.* I think one Dispensary with twenty beds as much as any man can attend properly with such limited assistance. Unless every one of these Dispensaries, or Hospitals, have a resident European Apothecary devoting his whole attention to its care, they will be of no earthly use in my opinion. They will not even be attended by patients.

*Q.* 12.

*A.* Yes, I think one Surgeon or Physician might superintend several in one quarter of the Town without much trouble, and with great benefit; but only as a superintending or consulting officer.

*Q.* 13.

*A.* I think so; but the best to be found in one quarter will be worse than the worst in another.

*Q.* 14.

*A.* I think that speedy removal from the locality where such fevers have been contracted is more than half the cure.

*Q.* 15.

*A.* I think so most certainly.

CALCUTTA,
*April 30th*, 1838.

D. STEWART, M. D.
*Assistant Surgeon.*

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## No. 20.

### ANSWERS BY MR. C. REID,

*Apothecary to the Colingah Dispensary, to the foregoing Questions—1st May*, 1838.

*Q.* 1.

*A.* The four months here specified, appear to me, at Calcutta, to be the most unhealthy months in the year. That fevers, both remittent and intermittent, are more prevalent during these months is in my opinion a fact. From personal observations, however, in a practice of upwards of ten years among the Native poor of Calcutta, I think that dysentery prevails most during the cold months, or immediately after the rainy season, and that cholera generally commences about the month of April and continues until the beginning of the periodical rains. With respect to the number represented as affected with these diseases, I have no sufficient information upon which I could form a correct estimate; but my opinion is that it is rather under than over-rated.

*Q.* 2.

*A.* The remittent and intermittent fevers continue during these months, but not in any great degree. The diseases prevalent from December to the end of March are

rheumatism and bowel complaints, which are then in a greater proportion than at any other period of the year; I mean particularly diarrhœa and dysentery. Upon the average number of deaths, I have not facts upon which I could make a correct report, for patients at Dispensaries only take medicine so long as they please, and many remove from Calcutta to their Native villages, so that they are lost sight of, and the result remains unknown.

*Q.* 3.

*A.* Fevers of the remittent and intermittent kind are prevalent from August to November, but I do not consider them as the most general diseases to which the Natives are commonly subject; for spleen, rheumatism, small pox, measles, tabes, mesentericá, difficult dentition, infantile remittent fever, worms, and numerous other diseases incident to children, in my opinion predominate. With respect to the fatal effects of one fever more than another, much must depend upon the constitution of the patient and the intensity of the disease. Remittent fevers are at all times considered more dangerous than intermittent—the latter when unconnected with visceral obstructions are not in my opinion dangerous. The greater proportion of fevers during these months are of the remittent type, and are very fatal in their effects.

*Q.* 4.

*A.* I can give no general answer to this Question; but, with respect to subjects which have come under my own immediate observation at the Dispensary, I can say, that not more than six or seven per cent, including those who come in the very last stage of the disease fall victims to it. With respect to the proportions that one fever bears to another, I think that the remittent prevails from August to November; but as fevers often change their type in the course of the disease, it is almost impossible to state in what proportions they may have presented themselves.

*Q.* 5.

*A.* Acute dysentery is always considered a dangerous disease. I can give no general answer as to the proportion that escape with life, but can say from my own observation at the Dispensary, that those who attend early in the disease generally recover.

*Q.* 6.

*A.* I differ very much in opinion from the representation here made, that intermittent fever produces diarrhœa; for from an experience of upwards of twenty years, both with Europeans and Natives, I am led to a different conclusion. That colloquative diarrhœa frequently occurs in the last stage of the disease is well known to every Medical practitioner, but it may take place in phthisis pulmonalis, or any other disease, as well as intermittent fever, and under which the patient generally sinks. Neither do I think diarrhœa produces enlargement of the spleen, my opinion is that spontaneous diarrhœa in the spleen is generally favourable, and that the enlargement takes place in consequence of the inefficient treatment of fevers by the Native Hakeems with respect to purgative medicine. Congestion of the spleen always takes place more or less during intermittent fever, a circumstance to which the Native Hakeems never attend; so that after the symptoms of fever disappear the enlargement of the spleen increases, which is by far the most intractable disease.

Anasarca, which includes all the symptoms referred to (except dyspepsia), seldom occurs until the patient is in the last stage of the disease. I am of opinion that t' ose who have been properly treated, and observe the prescribed course generally when recovered are

perfectly cured, so that the consequences of fever entirely disappear; but when that is not the case, and that visceral obstruction takes place, a great number die, or survive only to be victims at a later period. I think, however, that in some instances patients recover from intermittent fever with such Medical assistance as they can command, or with the aid of Natives alone, and that a great number are cured of the spleen; for, although the Native Hakeems in the cure of intermittent fever neglect all consideration of the spleen, yet when they treat it as a separate disease they are often very successful.

Q. 7.

*A.* In my opinion these diseases continue more or less during these months, with what proportion of mortality I have no means of stating.

Q. 8.

*A.* Persons affected with remittent fevers are generally confined to their beds during the continuance of the disease, but I have in many instances seen Natives, who have previously been benefited by European Medicine, attend in the cool of the morning at the Dispensary during the whole course of the disease, until they were perfectly recovered, although the symptoms appeared unfavourable. Cholera is so rapid in its progress and fatal in its effects, that the patient's life depends chiefly upon the promptness with which remedies are administered; if, therefore, persons attacked by cholera were immediately sent to an Hospital or Dispensary, instead of sending for Medical assistance, many lives would be saved. I am of opinion that relief can be afforded with every prospect of preserving life by a Dispensary for the diseases specified, with the exception of cholera, which requires constant attention under the direction of a skilful observer. But in all cases of acute diseases an Hospital presents the best means of preserving life. It does not appear to me that any benefit would arise from attending the sick at their own houses, for the Natives have a natural attachment to their own customs, so that whenever they are at full liberty they will consult their own oracle, so that the European Practitioner and the Bengalee Hakeem would be both consulted, and would counteract each other. The visits required from a Medical Practitioner must depend upon circumstances. In ordinary cases it should not be less than once or twice a day.

Q. 9.

*A.* Great relief can be afforded by Dispensaries from advice and medicine when application is made in the early stage of the disease, but many do not attend until they deem their case hopeless. The frequent change in the type of fevers renders it difficult in practice to state with correctness as to the majority one fever may have over another; but in my opinion generally through the year these fevers are nearly equal. I am inclined to believe if remittent and intermittent fevers were more perfectly cured, what I consider as the sequelæ of fevers would be greatly diminished; although spleen does not quickly prove fatal, yet if not cured the patient generally sinks under its influence. It is however a very general complaint among children in this country, in so much, that I may say that one fourth of the Native children are affected with this disease.

Q. 10.

*A.* My opinion is that there are no qualified Apothecaries, or Native Doctors, now unemployed in Calcutta, fit to undertake the duties referred to in this question, unless

young men can be furnished from the Medical College, but even if a sufficient number be found there, still no opinion can be formed of their efficiency until they will have been seen in practice.

*Q.* 11.

*A.* If it is intended that the person, in charge of an Hospital consisting of twenty beds, should be required in addition to his regular attendance on twenty patients to dispense medicine and advice to non-resident applicants for relief, I do not think he could attend to more than one such Hospital; but, if non-resident patients were not included, he might attend two such Hospitals if they were within a quarter of a mile of each other, and competent Native assistants stationed at each. Under such circumstances these Hospitals would present as reasonable a prospect of effecting cure, and preserving life, as any other establishments of a similar kind, although on a more extensive scale.

*Q.* 13.

*A.* I think it would be very difficult to find proper situations for Hospitals in that part of Calcutta where the population is dense: in other places at no very considerable distance eligible sites might be found.

*Q.* 14.

*A.* There can be no doubt that the ill constructed huts in which the Natives reside, the bad air and the dirt and filth by which they are surrounded, must produce disease and obstruct recovery. Therefore if practicable, it is always desirable that patients should be removed to healthy situations.

*Q.* 15.

*A.* It is always necessary that Hospitals should be surrounded with good air, well ventilated, and provided with proper accommodation. I am therefore of opinion that open airy situations should be selected, that the edifices should be well raised, built of solid materials, and capable of resisting in a certain degree both damp and heat; for without these advantages, cure or even the preservation of life must in many cases be very doubtful.

CHARLES REID,

*May 1st, 1838.* *Apothecary in charge of Colingah Dispensary.*

## No. 21.

To THE HONOURABLE SIR J. P. GRANT,

*Chairman of the General Committee.*

DEAR SIR,

I have been endeavouring to ascertain with some approach to accuracy the proportions of sick to well amongst the Natives, with the view to test the correctness of Modoosoodun's estimate; but the total absence of any thing like statistical information on this head, leaves the question where it was. In England it is estimated that 30 per cent. of the living are annually sick, and 3 per cent. constantly so. If we double the latter, we may here, perhaps, approach the truth; and out of 1,225,000 inhabitants of the 24 Pergunnahs, City, and Suburbs, we shall have a large mass of suffering.

This need not dishearten us, however; for, in countries the most civilized and wealthy, it is but a small part of the suffering that is alleviated by Hospitals, or that can be so. If the more urgent and acute diseases are treated, a great deal is done to relieve suffering, and save life. Again, we know that out of 100 Europeans who die in Bengal, 26·8 are from fever; 7·3 from liver diseases; 30.5 from dysentery, and other bowel complaints; 19·8 from cholera; 4·6 from pulmonic diseases, 1·9 of which are consumptive cases; leaving only eleven produced by other diseases. Applying the above statistical facts to Native health, we perceive at once how large must be the proportion of fever, dysentery, and diarrhœa amongst the ill-fed and half-clothed Bengalees.

I cannot conclude this very unsatisfactory account without soliciting your attention to the great importance of Medical statistics, and to the benefits that may accrue to Native health from rendering the proposed Hospital at once subservient to the elucidation of this subject, on which I cannot say that we have now any one well established fact. Next to the immediate relief of suffering, and the purposes of Native Medical education, those of Medical statistics will prove most important.

To Hospital statistics we owe a knowledge of the expected duration of different diseases at several stages of their progress, and the extent to which their mortality and duration are diminished by remedial means; for a correct mode of classifying the *ages* of patients is that which alone can determine the great practical question of the relative value of any given system of Medical management, from the well known fact, that a difference of twenty-three years in the *ages* of two classes of patients will cause a doubling of the mortality under the same plan of treatment—a fact, I fear, but too often unknown, or purposely concealed, by the advocates of exclusive systems, and the pretenders to wonderful cures. To courses alike injurious to publick health and the credit of the Medical profession, a simple Hospital account will for ever put a stop. The attention of European Governments and of the Medical profession at home is now actively occupied with this important subject, with a view not only to determine the "mean but the maximum and minimum of sickness connected with different rates of mortality, and the causes of disease; for then Benefit Societies could be placed on a sure footing, the Medical officers of an army could almost predict how many would die, or be efficient for service, in any climate or circumstance, and a full measure of the happiness would be found in the health of a population." The state of existing knowledge in this country on these interesting questions is extremely limited, and all we really know for a certainty is, that, what with the early marriages and early deaths of a tropical climate, generations are made to pass away with an extraordinary rapidity. Of the connection subsisting between the social position and physical development of the different classes of Natives, we know also extremely little, and it is to be feared we shall long continue in our ignorance unless the Government—the sole moving power in India—come to our aid.

With this brief notice of our ignorance, and of some of the advantages to be derived from a better knowledge, I beg to conclude, with many apologies for unavoidable haste, and remain,

Dear Sir,
Yours very truly,
J. R. MARTIN.

NATIVE HOSPITAL,
*May 1st*, 1838.

# No. 21. (A)

*Table shewing the Number of In and Out Patients treated at the Native Hospital during the Five Years, ending August 31st, 1837,—with net expenditure for each year.*

| Years. | Patients. Admitted. In | Admitted. Out | Cured. In | Cured. Out | Died. In | Died. Out | Remaining 31st August In | Remaining 31st August Out | Expenditure. Cost of Europe Medicine supplied by Government. | Expenditure. Hospital Charges, Salaries, Furniture, Repairs, &c. &c. | Expenditure. Total. | Average Annual Revenue. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1832–33 | 482 | 27299 | 405 | 87034 | 38 | .. | 39 | 265 | | 17751 4 8 | | | The Statement of the Cured of Out patients merely means that the patients have ceased attendance. We have no means of more correct information. |
| 1833–34 | 901 | 81382 | 804 | 81140 | 57 | .. | 40 | 242 | | 13948 3 4 | | | |
| 1834–35 | 1023 | 72380 | 931 | 72175 | 49 | .. | 43 | 205 | | 13592 4 6 | | 30135 14 7½ | |
| 1835–36 | 1014 | 75281 | 931 | 75068 | 47 | .. | 36 | 213 | | 17710 3 8 | | | |
| 1836–37 | 956 | 75680 | 879 | 75457 | 45 | .. | 32 | 223 | | 18674 7 2 | | | |
| | 4376 | 392022 | 3950 | 390874 | 236 | .. | 190 | 1148 | | 81676 7 7 | | | |

*Note.*—The dependent Dispensaries cost, on an average, Rupees 645 per mensem, or an annual cost of Rupees 7,728 : 6 : 4. Taking the cost of Out-patients at the Native Hospital to be less than that of the Dispensaries, and estimating it at half the total expenses, it will bring the cost on account of 875 In-patients per annum, to Rupees 12,471 : 1 : 6, or Rupees 14 : 4½ for each In-patient. The same class of patients treated in the English Hospitals is found to cost, exclusive of furniture, repairs, and buildings, 1*s.* 7*d.* per day. The annual cost of an In-patient in eight Infirmaries is found to be 31*l.* 17*s.* This includes furniture, repairs, salary, and maintenance of officers, servants, and every item except medicines.

J. R. MARTIN.

## No. 21. (B)

*Expenses of the Native Hospital and Dispensaries for Five Years.*

| Years commencing 1st Sept. and ending 31st August. | Native Hospital. | | | | | Park Street Dispensary. | | | | Gurranhatta Dispensary. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hospital expenses, including establishment, dieting, &c. | Surgeon's Salary. | Secretary's Salary and establishment. | Repairing Hospital Quarters. | Total. (Co. Rs. A. P.) | Expenses of Country Medicines. | Establishment including Surgeon's allowance. | House Rent. | Total. (Co. Rs. A. P.) | Expenses of Country Medicine. | Establishment including Surgeon's allowances. | House Rent. | Total. (Co. Rs. A. P.) |
| 1832-33 | 10008 5 9 | 2240 0 0 | 2150 6 5 | 3352 8 6 | 17751 4 8 | 1526 2 1 | 5072 13 9 | 1738 0 0 | 8336 15 10 | 1461 5 1 | 5072 14 0 | 1200 8 0 | 7814 3 1 |
| 1833-34 | 9131 2 3 | 2240 0 0 | 2150 6 5 | 426 10 8 | 13948 3 4 | 1460 1 3 | 5121 15 11 | 1664 0 0 | 8246 1 2 | 1412 7 2 | 4977 1 9 | 1200 8 0 | 7669 8 11 |
| 1834-35 | 8900 0 3 | 2240 0 0 | 2150 6 5 | 301 13 10 | 13592 4 6 | 1319 10 3 | 5048 3 5 | 1664 0 0 | 8031 13 8 | 1365 14 9 | 4854 14 10 | 1200 8 0 | 7500 13 7 |
| 1835-36 | 9024 4 11 | 2240 0 0 | 2129 0 11 | 4316 13 10 | 17710 3 8 | 1088 5 7 | 4786 2 8 | 1664 0 0 | 7538 8 3 | 1244 14 0 | 4827 2 10 | 1273 0 0 | 7345 9 10 |
| 1836-37 | 10475 3 0 | 2240 0 0 | 2086 6 0 | 3872 14 2 | 18674 7 2 | 1037 6 2 | 4766 15 8 | 1664 0 0 | 7468 5 10 | 1251 14 9 | 4827 2 0 | 1254 0 0 | 7332 0 9 |
| Total Co. Rs. | 47539 0 2 | 11200 0 0 | 10666 10 2 | 12270 13 0 | 81676 7 4 | 6431 9 6 | 24795 3 7 | 8394 0 0 | 39621 12 9 | 6736 7 9 | 24559 3 5 | 6367 0 0 | 37662 3 2 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Interest for five years on Hospital Funds invested in Government Securities average per Annum, Co's. Rs. | 12,685 | 0 | 0 | ........ | 64,324 | 15 | 11 |
| Government Monthly Donation for five years ...... Ditto, ........ Ditto,............ | 12,684 | 0 | 0 | ........ | 63,422 | 7 | 6 |
| Subscriptions Legacies, &c. for five years ........ Ditto, ....... Ditto............ | 5,186 | 6 | 8 | ........ | 25,932 | 1 | 7 |
| Total, Co's. Rs....... | | | | | 1,53,679 | 9 | 0 |

Interest for five years on the funds of the Park Street and Gurranhatta Dispensaries invested in

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Government Securities, average per annum ........................................ Co's. Rs. | 571 | 11 | 6 | ........ | 2,858 | 9 | 6 |
| Government Monthly Donation for five years ..................Ditto......Ditto........ | 11,411 | 2 | 4 | ........ | 57,070 | 11 | 8 |
| Subscriptions, &c. ................................................................................ | | | | | 224 | 0 | 0 |
| Total, Cos. Rs........... | | | | | 60,153 | 5 | 2 |

Calcutta, Native Hospital,
*May 1st, 1838.*

W. DA COSTA, *Secretary.*

## No. 22.

*Medical College, May 3d,* 1838.

My Dear Sir,

My cousin, Mr. R. O'Shaughnessy, has to-day the pleasure of forwarding to you his replies to the several queries addressed to him by the Fever Hospital Committee. On attentive consideration of the subject, I do not find any thing additional to append to the evidence, I have already given on this question. I avail myself of the opportunity, however, to ask you to do the Professors of the Medical College the honour of visiting the Dispensary Hospital they have recently opened, and which they think shews strongly and decidedly the great benefits derivable from the system of small Hospitals suggested to the Committee.

I have the honour to be, Dear Sir,
Your faithful Servant,
W. B. O'SHAUGHNESSY.

The Honourable
SIR J. P. GRANT.

## No. 22. (A)

*May 3d,* 1838.

Dear Sir,

Having at last got the answers from Mr. Ryper, I have the pleasure to return the Paper you sent me, with such answers as I am able to give written opposite the last seven questions. Mr. Ryper's replies to the first eight queries are written on a separate sheet of paper. I expected that he would have been able, from his long experience, to give a more full and satisfactory account of the prevailing diseases and their consequences, but from the absence of all Hospital records, it is very difficult indeed to form any correct idea of the relative number of deaths from any single disease, or the proportion one disease may have to another.

I remain, Sir,
Yours very truly,
R. O'SHAUGHNESSY.

The Honourable
SIR J. P. GRANT.

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## No. 22. (B)

### ANSWERS OF MR. J. RYPER

*To the First Eight of the foregoing Queries—May 1st,* 1838.

Q. 1.

*A.* The four months here stated appear to me to be the most unhealthy months in the year at Calcutta. That fevers, both intermittent and remittent, are more prevalent during the above mentioned months is in my opinion correct. From personal observations in a practice of upwards of twelve years among the poor of Calcutta, I am of opinion that dysentery prevails mostly during the cold time of the season; and the cholera commences about the month of April and continues till the rains set in.

In regard to the mortality here represented as 18,000 persons, I have not any sufficient proof of its correctness.

Q. 2.

*A.* During these months the remittent and intermittent fevers continue, not to any great extent. The diseases during the months of December, January, February, and March are rheumatism and bowel complaints, which are then more in number than at any other time of the year, particularly diarrhœa and dysentery. With respect to the average number of deaths, I have no facts upon which I can make a correct report, as the patients take medicines as long as they please, or they do not regularly attend; consequently the result remains unknown.

Q. 3.

*A.* Fevers of the remittent and intermittent kind are prevalent from August to November; but I do not think that these are the general diseases that the Natives are commonly subject to—rheumatism, small pox, spleen, measles, worms, and various other diseases incident to children, are in my opinion prevalent. With respect to the fatal effect of one fever and another, it depends much on the constitution of the patient, and the intensity of the disease. Remittent fevers are always considered to be more dangerous than the intermittent—the latter when unconnected with the visceral obstruction are in my opinion not dangerous; the greater proportion of the fevers, during the above mentioned months, are of the remittent type, and fatal in their effects.

Q. 4.

*A.* I cannot give any answer to this question; but with respect to the proportion that one fever bears to another I think that the remittent prevails mostly from August to November; and, as fevers generally change their type in course of the disease, it is impossible to state in what proportion they may have presented themselves.

Q. 5.

*A.* Acute dysentery is always considered to be a dangerous disease. I can give no general answer as to the proportion that escape with life, or to that it bears to the intermittent fever.

Q. 6.

*A.* I differ in opinion from the statement here made that intermittent fever produces diarrhœa. I am of opinion that colliquative diarrhœa frequently occurs in the last stage

of the disease; and is likely to take place in any other disease as well as intermittent fever; and under which the patient sinks. Nor could I think diarrhœa produces enlargement of the spleen. I am of opinion that diarrhœa in the spleen by no means proves fatal, and that the enlargement of the spleen takes place in consequence of the Hakeems having an aversion to giving purgatives freely at the commencement of the fevers. Anasarca includes all the symptoms referred to except dyspepsia, which seldom occurs until the patient is in the last stages of the disease. I am of opinion those that have been properly treated, and observe the rules told them, are generally perfectly cured; if otherwise, and that visceral obstruction takes place, a great number die or linger a considerable time. I think however many of them recover from intermittent fever with such Medical assistance as they can command, and that a great many are cured of the spleen.

*Q.* 7.

*A.* To the best of my opinion cholera and small pox are most prevalent diseases during the months of April and May; fever, remittent and intermittent, and dysentery, from April to July in a great deal lesser degree than at any other time of the year. With respect to mortality I have no sufficient proof upon which I can make a correct report.

*Q.* 8.

*A.* Persons attacked with remittent fever are generally confined to their beds during the continuance of the disease; but in many instances they have attended the Dispensary in an advanced stage and recovered. In dysentery the poor Natives never confine themselves to beds unless it is in the last stage of the disease. Cholera is a disease so rapid in its termination, that the patient's life merely depends on the promptness of the assistance given to them.

JOHN RYPER,
*Apothecary, Gurranhatta Dispensary.*

## No. 22 (c)

### ANSWERS OF MR. R. O'SHAUGHNESSY

*To the foregoing Queries—May 1st,* 1838.

*Q.* 8.

*A.* I do not think for diseases of so severe a character as dysentery or remittent fever that a mere Dispensary, such as the Gurranhatta or Colingah, is of the slightest use; and I am of opinion the only likely way of saving the lives of the poor, attacked with these diseases, is by removing them, as soon as attacked, to an Hospital where every care and comfort should be given to them.

I do not think the plan of visiting the sick poor at their own houses is calculated to succeed as well in this country as a person would at first be disposed to expect, or as the knowledge that such a system in Europe has been found to work so well, and be the means of saving so many lives, and so much misery, would induce one to hope from a similar plan, if adopted in Calcutta. But many of the habits, customs, and prejudices of the Natives of this country, as well as the filthy, confined, and ill ventilated houses in which they live, are against even the chance of its success here. As a general habit the Natives sleep on the ground; and, if I have been correctly informed, the

universal custom, before the family sit down to eat their daily meal, is to sprinkle the floor profusely with water, which they allow to dry by evaporation, and this in the apartment where the Doctor would be treating a patient for severe fever or acute dysentery; and I think under such circumstances all his medicines and advice (supposing them to be take and followed with care, which I am convinced in one case out of fifty would not be the case) would do but little good.

*Q.* 9.

*A.* I think intermittent fever, generally speaking, may be cured, if the persons attacked with it apply early, and attend regularly, at a Dispensary. Unless in the intermittents of long standing and unusual severity, it would not be necessary to remove the patients suffering from it to an Hospital, and indeed in the severe and intractable cases (uncomplicated with diarrhœa or enlarged spleen) the best chance of recovery is offered by change of air, and the least by the crowded Wards of an Hospital.

From my own observation, I should say there was a considerable majority of intermittent fever over the other fevers, but can form no idea of the proportion they bear to each other. It often, I think, follows as a consequence of remittent; or, in other words, the remittent not unfrequently run into the intermittent, if not medically attended to. I have no doubt but there would be a material diminution in the number of intermittent if the remittent fevers were perfectly cured, and that could only be accomplished by the proper care and treatment a well regulated Hospital would afford.

*Q* 10.

*A.* I do not think there is at present in Calcutta (with exception of the two Pundits of the Medical College) a single Native Doctor of any Medical education or skill, and therefore not one, with the above exceptions, fit to be trusted with the treatment of these diseases, even with the occasional advice of an European Physician.

*Q.* 11.

*A.* I do not think in the present state of Native Medical skill, in as much as there are no skilful Native Doctors in Calcutta, that one European Apothecary could attend to more than one small Hospital; and, if he had to attend day and night to from twenty to thirty patients with acute diseases, and prescribe for Out-patients also, I think he would have quite enough to do. I believe, though, it would be as difficult to find in Calcutta a sufficient number of *qualified* European Apothecaries to take charge of the proposed Dispensaries, as it would be to find trustworthy Native Doctors. By qualified Apothecaries I mean persons who could produce proof of having received the education required by the Apothecaries' Hall, and diploma as a proof of having passed the necessary examination; for I think it is the least qualification that should be required from any European applying for charge of a Dispensary; as the education, that a mere compounder of drugs is obliged to possess in Europe, cannot be considered too much to expect from one who seeks an appointment in Calcutta, the duties of which must often call on him to exercise the skill not only of a Physician, but also that of a Surgeon.

In the course of the next six months the Medical College will send out a number of young men highly educated in the healing art, and eminently qualified for the charge of District Hospitals or Dispensaries; and, as their education has already been more extensive than that required by the Apothecaries' Hall in London, it would of course be inconsistent to place them under men of inferior professional acquirements; consequently European Apothecaries would not be required.

I think one graduate of the Medical College, with the usual establishment of compounders and coolies, would be fully competent to take charge of one small Hospital, to prescribe for Out-door patients, and visit the sick in his neighbourhood; at least such cases as cannot be removed without danger, or persons who, though not rich enough to pay for the attendance of an European Physician, still from pride or prejudice or other causes may be prevented from entering a Publick Hospital; for no matter how large an establishment there may be organised for the reception of the sick poor of Calcutta, there will remain hundreds of such persons outside its walls who must perish if unassisted.

*Q.* 12.

*A.* I think one Surgeon, if he had not much to do, could superintend three or even four Dispensaries or small Hospitals; but I know from experience that a flying visit and a few hurried inquiries, such as a man in very extensive practice only could afford time to make, would be but of little use to discharge the duty of Superintendent with advantage to the poor, and at the same time give *real assistance* to the resident Apothecary. Frequent visits, and often patient delays, will be required, so that *one* is the most that a Surgeon in extensive practice could attend to.

*Q.* 13.

*A.* I do not know the Native part of Calcutta well enough to answer this question.

*Q.* 14.

*A.* I think that by removing those labouring under acute diseases to a well constructed, well ventilated, and sufficiently raised house, the difficulty of cure would be diminished by at least one half, and the permanence of the effects of Medical treatment increased ten-fold.

*Q.* 15.

*A.* Certainly; I think it of the greatest importance that the apartments for the sick should be well raised from the ground, built of brick, and provided with all necessary accommodations.

R. O'SHAUGHNESSY,

*Superintendent of the Gurrunhatta Dispensary.*

*May 3d,* 1838.

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## No. 23.

### QUERIES PUT TO R. S. THOMSON, ESQ.,

*Member of the Committee.*

*Q.* 1. In your business as a chemist have you occasion to know the quality of the water of the *Loll Digghee*, or the large Tank in Tank Square? For what purposes do you employ it, and do you find it to be pure and wholesome water, such as may at all times be used without injurious effects for drinking and preparing food with? Or if not at all times, with the exception of what, and how long periods?

*A.* I have been resident in the neighbourhood of Tank Square for the last twelve years, and have been in the constant habit of employing the Loll Digghee water for all domestick purposes, as well as for the manufactory of Soda Water. From the facilities I possess in being enabled to keep up a large supply of the Loll Digghee water in a purified state, I have never had occasion to complain of it as injurious during the whole year, either as a drinking water, or employing it for culinary purposes.

I would except the periods when the Tank is filled from the River, at which times it must necessarily contain many impurities, but I have generally found that ten days or a fortnight was sufficient to render it available to the inhabitants as a pure drinking water, and perfectly wholesome.

*Q.* 2. Have you ever had occasion to supply Loll Digghee water to persons going to sea? For what length of time have you known it to keep perfectly good and pure at sea, and after what chemical process? And would water impregnated with saline and other impure matter have answered equally well after undergoing the same process?

*A.* I have had frequent occasions to supply the Loll Digghee water to persons proceeding to sea, and have known it to keep in perfect purity during a voyage to England. One lady who took a stock of it with her on the homeward passage, wrote to me from Liverpool that she had produced a bottle of it at that port some time after her arrival in comparison with the drinking water there, and it was not surpassed in either sweetness or transparency. The only purifying process it undergoes with me is filtration through a bed of sand and charcoal, and this on a large scale, previously immersing in each Pegue jar a red hot iron to destroy the animalculæ. These jars are joined by connecting pipes, and the purified water is gradually collected in a reservoir underneath, from whence it is drawn off in the usual manner.

The water in the reservoir has sometimes remained four months without deteriorating, and I consider its salubrity to depend materially on the advantage it possesses by being allowed to settle down in the Tank before it is withdrawn.

*Q.* 3. Do you know the quality of the water in other Tanks and in Wells generally in Calcutta and Chowringhee, and that of the Hoogly? And can you inform the Committee of the degree of wholesomeness or unwholesomeness of the water in other Tanks, and in Wells, and of that of the Hoogly, at times of the year when there are no freshes in the River, as compared with that of the Loll Digghee, which is supplied from the River during the height of the annual freshes?

*A.* From my contiguity to the Loll Digghee, and a general impression on my mind of its superiority over the water in other and smaller Tanks, I have not any knowledge of them sufficiently decisive to offer. But, with regard to the river Hoogly, I have always understood from commanders of vessels frequenting this port, that the water drawn from that source is equally salubrious with that procurable in any other part of the Globe: and within the last three years, since the filtering boats have been established, it is considered superior, leaving no sediment in the casks, and seldom if ever undergoing decomposition.

R. SCOTT THOMSON.

*May 10th,* 1838.

## No. 24.

*Additional Questions to which Answers are requested by the Fever Hospital and Municipal Committee from*

### MODOOSOODUN GOOPTO.

Q. 1. You have stated in your evidence before the First Sub-Committee on the 29th May, 1837, that the most unhealthy season of the year in Calcutta is the four months from August to November, during which the people suffer under intermittent, remittent, and bilious fevers, and dysentery and cholera. And you have also stated your belief that about 500 persons in each Thannah at an average, making in all, about 18,000, suffer under these diseases during the above four months. Do these diseases, or any and which of them, continue, though in a less degree, during the next four months of December, January, February, and March? To what extent in point of number, and with what proportional degree of intensity, and average number of deaths, during these four last mentioned months, do these diseases, or any of them, continue to operate?

*A.* I continue of opinion that the months I mentioned are the most unhealthy of the year, and that these are the most prevalent diseases. It is very difficult to state the number of persons who are afflicted with them during these months, but I have no reason to believe that my statements differ materially from the truth. I consider the months of December, January, and February, and the first half of March as the healthiest part of the year. But if during these months there are changes of unusual warmth or moisture they are not so healthy as they would otherwise be.

During these months the above diseases do not frequently occasion new cases. Enlargement of the spleen, chronick inflammation of the liver, dyspepsia, diarrhœa, chronick dysentery, œdematous swellings attendant upon intermittent fever, continue with the intermittent fever during these months, if the fever has not been perfectly cured before. Jaundice, the consequence of intermittent fever, also continues.

During the same season, which I have described as the most unhealthy season, the same diseases occur every year; but the number of those attacked by them varies very much, and of those attacked the number who die varies very much, in different years.

My statement of 18,000 persons afflicted refers to a very unhealthy season. In such a season, I think probably one-tenth of these diseases would run into the following months of December, January, February, and March. About one-fifth, of those attacked probably die before December. Of the one-tenth, which run into December and following months, probably one-half terminate fatally before the middle of March. Of the remainder, many recover; with others, enlargement of the spleen, and affections of the liver, last with intermittent fever for many months, when they terminate fatally.

Q. 2. You have stated in your evidence before the Second Sub-Committee, on the 27th February, 1837, that bilious, remittent, and intermittent fevers, are the most prevalent diseases among the Natives in Calcutta, and that these fevers, except the intermittent, are dangerous to life, and certain to be fatal if not attended to medically. Are the Committee to understand that the much larger proportion of fevers prevalent from August to November are of the intermittent kind, and consequently less dangerous to life?

*A.* These are the prevalent fevers among the Natives in Calcutta. The cases of bilious and remittent fevers are usually more in number than those of intermittent fever. I think cases of primary intermittent fever do not exceed 20 per cent of the other two taken together. The remittent and bilious fevers are nearly equal. But the remittent and the bilious frequently change into intermittent fevers—taking these secondary intermittents

into view, the number of intermittent fevers will be nearly 50 per cent. of the whole. Intermittent fevers, whether primary or secondary, while they retain the character of intermittents, are less dangerous to life than remittent or bilious—meaning by *bilious* all continued fever.

*Q.* 3. Of the number of the poor suffering under remittent and bilious fevers during the period from August to November, what proportion in your opinion escape with life? And what proportion do the remittent and bilious bear to the intermittent?

*A.* In such a season as I have referred to, I think about one-fourth of the poor, attacked by remittent and bilious fevers during this period, die—about one-fourth entirely recover—and two-fourths escape with life, the disease changing into intermittent fever. I have already answered the remainder of the question. I have already stated the usual consequences of intermittent fever.

*Q.* 4. You have said, in your evidence before the Second Sub-Committee of the above date, that dysentery is always dangerous. Of the number of the poor suffering under dysentery during the period from August to November, what proportion in your opinion escape with life? And what proportion do the dysenteries bear to the intermittent fevers?

*A.* I think not more than one-half of the poor suffering under dysentery during this period escape with life. The fatality is equal during other periods of the year among those attacked; but the number attacked is much fewer. I think the poor suffer during these months from dysenteries and intermittent fevers in nearly equal proportions.

*Q.* 5. You have said, in your evidence before the Second Sub-Committee of the above date, that the intermittent fever produces diarrhœa, and if attended with diarrhœa almost always produces an enlargement of the spleen—that the diarrhœa following intermittent fever is generally fatal if not medically attended to—and that the enlargement of the spleen, though not generally fatal of itself, produces, if not cured, dyspepsia, œdematous swellings of the legs and hands and loins, and anasarcha, which are fatal. Do these consequences of the intermittent fever of the period from August to November prevail during the next four months among those who have escaped with life? What proportion of them are so affected during the months from December to March? In what proportion do you believe they die, or survive only to fall victims at a later period? And are you of opinion that any of them entirely recover without Medical assistance, or with such Medical assistance as they can command?

*A.* My evidence upon this subject on the above date has been erroneously printed or taken down. What I meant to say, and what I thank I must have said, was, "The intermittent fever, according to my observation of it, if it produces diarrhœa, does NOT produce an enlargement of the spleen. But if it is *not* attended with diarrhœa, it almost always produces an enlargement of the spleen." I wish to add, that after the enlargement of the spleen, the accompanying intermittent fever may sometimes produce diarrhœa, which is generally fatal. I have already answered the rest of the questions here put except the last.

In a few cases a change from Calcutta to the climate of a higher country may cure intermittent fever or diarrhœa. The fever with enlargement of the spleen may be alleviated by such change of climate, but cannot be cured without proper Medical assistance. The other consequences also may be in some degree alleviated, but never cured by any change of climate.

There is to be found, but not commonly, sufficient skill among Native Physicians, and

they are acquainted with Native medicines of sufficient efficacy, to cure some of these diseases; but the poor cannot command their assistance, and it is a matter of chance their being able to find such an one, and very unlikely.

*Q.* 6. During the remaining four months of the year, from April to July, do these diseases of intermittent, remittent, and bilious fevers, and dysentery, and cholera, or the diseases, which are the consequences of the said diseases, prevail, and with what degree of intensity, and with what proportion of mortality?

*A.* Those months are not generally unhealthy, but in some years they are very much so in some respects. When the heat is excessive, and there is a deficiency of rain, there is generally much cholera and diarrhœa, some dysentery, and some bilious fever—much small pox and chicken pox and measles. The cholera when it prevails is generally very fatal among the poor. It is very frequently fatal among the rich; but of the poor few escape that are attacked with it, for want of proper assistance. Intermittent and remittent fevers are not common in these months.

*Q.* 7. Upon your examination, as above mentioned, by the First Sub-Committee, you stated that the persons afflicted with the diseases mentioned in the most unhealthy seasons of the year are confined to bed for the time the fever lasts. The Committee understand this to mean with the exception of intermittent fever, and to be confined to remittent and bilious fevers, and dysentery, and cholera. In these last mentioned cases is it possible to administer relief with any probable chance of saving the patient's life from a Dispensary for distribution of medicines only, or is there any other probable way of saving the patient's life than either by his removal to an Hospital, or to a Dispensary with beds, which is, in truth, a small Hospital, where he may receive skilful treatment and care, or by his being attended at his own house during the continuance of the disease by a skilful Medical practitioner? And how frequent ought the visits of such practitioner usually to be?

*A.* In intermittent fever during the paroxysm the patient is confined to bed, but during intermission he is able to walk; but, if the fever is not checked, he becomes in a few days unable to walk to any distance during intermission, from debility. In primary remittent fever he is confined to bed during the whole progress of the disease. Sometimes intermittent fever changes into remittent, and this secondary remittent partakes so much of the nature of the intermittent, that the fever abates sufficiently during remission to enable the patient to walk. In bilious fever he is always confined to bed. In dysentery, for a few days after the commencement, he may have strength enough to walk, but for obvious reasons must find it impossible to go even to a short distance. In a few days he is in a state of prostration. Of cholera it is unnecessary to speak. No Medical man of what skill soever can prescribe for a patient labouring under any of these fevers, or dysentery, with safety to the patient's life, upon the report of a person not a Medical man, without seeing the patient.

There is no *possible* way of saving the patient's life than either by his removal to an Hospital, large or small, where he may receive such skilful treatment and care, or by his being attended at his own house in the manner mentioned. Generally the visits must be twice a day in serious cases; in slighter cases, or after the symptoms have diminished, once a day, or every other day. The greater part of these diseases in this country are serious cases, and rapid in their progress.

*Q.* 8. In cases of intermittent fever can material relief be afforded from Dispensaries by the distribution of medicines and advice given at the Dispensary only to such

as can present themselves there or send to receive them? Do intermittent fevers constitute the great majority, and by how much the majority, of the fevers of this place? And do not many of the intermittent fevers follow as consequences upon remittent fevers? And would they not be greatly lessened in number by effecting a more perfect cure, and in a greater number of cases, of remittent and bilious fever?

*A.* I think that in intermittent fever material relief can be thus afforded, so long as the patient can present himself personally at the Dispensary; but not unless he can do so. I have answered the other parts of this question. There can be no doubt but the more perfect cure, and the reducing the number of cases, of remittent and bilious fever, would greatly lessen the number of cases of intermittent fever.

*Q.* 9. How many Native Doctors or Apothecaries are you of opinion could now be found in Calcutta, of sufficient Medical knowledge and discretion to be trusted alone with the resident superintendence of an Hospital with twenty beds or more, for the treatment of patients labouring under remittent and bilious fevers, and dysentery, under the advice and directions once or twice in a day of a visiting European Physician? And how many of such qualified Native Doctors or Apothecaries could be found in Calcutta, to visit and prescribe for patients labouring under such fevers, and dysenteries, at their own houses, under such advice and instructions only as they might obtain from an European Physician, upon a daily report of the progress of disease or cure in the cases under their care, with safety to the life of the patient, and with a reasonable prospect of cure?

*A.* There are two or three, but not more, who know sufficient of European Medical practice to be trusted either with the superintendence of such an Hospital, or to visit and prescribe under such advice and direction and instructions as are here mentioned. After a lapse of eight or ten months some of the senior students of the Medical College will be fit to be trusted with such superintendence, or so to visit and prescribe under such advice and instructions.

I consider it to be the duty of the superintending Medical officer, an European Physician or Surgeon, to visit the Hospital at a certain hour every day, to receive from the Apothecary a written description of each case, to examine the state of each patient, ascertain the correctness of the written description, and to prescribe. I think the students, in the time I have mentioned, will be fit to be trusted to draw up such reports—to superintend the administering the medicines prescribed—and, in case of any sudden and violent symptom occurring, to administer, in the absence of the Physician, a remedy that may alleviate the symptom without danger to the patient till the Physician's return.

The same opinion with regard to the capacity the pupils will have for watching over and reporting of cases, explains my opinion of their being in that time safely intrusted with visiting patients at their own houses.

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# No. 25.

*Particulars for Estimates of the Expense of erecting one or more Hospitals, submitted by Mr. Martin, at the request of the Chairman, to Captain Fitzgerald; extracted from Sir J. P. Grant's Letter to Mr. Martin, dated April,* 1838.

1st. A rough estimate of the expense of building an Hospital with substantial brick walls, the lowest floor inhabited by the patients being raised twelve feet, (or if you think it sufficient, ten feet) from the ground—either on open arches or godowns, as shall be most economical—with *jilmils* and glazed windows—and the rooms of sufficient height—and with a sufficiently thick roof, or, as I should recommend, a moderately thick roof with a thinner false roof over or under it at the distance of a foot, to exclude the heat produced by the direct rays of the sun—consisting of four Medical Wards, and one Surgical, each to contain fifty beds—and either one or two tiers of apartments, as shall be most economical—with sufficient apartments for the establishment, and baths, and the necessary accommodations for the patients, the description and number of which I leave to you.

2d. A similar estimate of the expense of building twelve small Hospitals similarly constructed, of which eleven to receive twenty patients each, and one to receive thirty.

To J. R. MARTIN, ESQ.,

*April 9th,* 1838.

I am of opinion that a really good and substantial Hospital, raised in the manner you mention, with every accommodation attached, both internal and external, capable of containing 250 European patients will cost about Rupees 3,00,000.

Twelve small Hospitals, capable of containing the same number of patients in their aggregate, will, if built on the same plan as regards comfort and convenience, cost considerably more than the above, and in round numbers I should say about Rupees 4,00,000.

These sums may startle you a little, but when I tell you that the present Sudder Dewannee Court House, originally intended as an Hospital for 200 Europeans, actually cost in building Rupees 2,42,850, I think you will admit I have not overstated the probable cost of the two descriptions of buildings regarding which you require information.

I must, however, add that the Sudder Court House, is, or rather was—for it has undergone alterations—complete in every respect as an Hospital. Its plan is excellent, it has central spaces for the patients, with enclosed verandahs, and open verandahs beyond them, and the whole throughout is flagged with Chunar stones. My opinion is therefore given with reference to your requiring a building of the description just mentioned; if you want an inferior kind of Hospital, the cost would of course be very much diminished.

Yours, &c.

*(Signed)* W. R. FITZGERALD.

# No. 26.

To MR. J. MORRIS,

*Clerk to the Committee of Municipal Inquiry.*

SIR,

I have the honour to acknowledge the receipt of your Letter, dated the 10th instant, of which I am reminded by yours of yesterday's date, and to inclose an Abstract Statement of expense incurred in forming of Wellington Square, as required therein.

I have the honour to be, Sir,
Your most obedient Servant,

*(Signed)* ROOPNARAIN GHOSAUL

CALCUTTA,
*May 15th*, 1838

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*Abstract Statement of expense incurred in forming the Tank and Square at Beparytollah, now called Wellington Square.*

| | Sa. Rs. | | |
|---|---|---|---|
| Value of Ground, &c. (about 16 Biggahs,) .. .. .. .. .. | 87,343 | 6 | 10 |
| Ditto, Buildings, &c., .. .. .. .. .. .. .. .. .. .. .. | 1,04,282 | 0 | 0 |
| Additional sum paid to Emambux, .. .. .. .. .. .. .. | 11,230 | 0 | 0 |
| Excavating the Tank, ... .. .. .. .. .. .. .. ... .. | 10,000 | 0 | 0 |
| Ghaut, .. .. .. ... .. .. .. .. .. ... .. .. | 1,350 | 0 | 0 |
| Wall round the Tank, .. ... .. .. .. . .. ... | 2,295 | 0 | 0 |
| Railing, &c., .. ... .. .. ... .. .. . .. ... . | 11,957 | 5 | 0 |
| Road round the Square, .. .. ... .. ... .. .. .. | 3,360 | 0 | 0 |
| ... | 2,31,817 | 11 | 10 |
| Deduct four Biggahs, more or less, of ground, to the East and West side sold for, say, Sa. Rs. 400 per Cottah, or 8,000 per Biggah | 32,000 | 0 | 0 |
| Total, .. | 1,99,817 | 11 | 10 |

*(Signed)* ROOPNARAIN GHOSAUL.

*May 15th*, 1838.

# No. 27.

## To THE CHAIRMAN

*Of the Fever Hospital and Municipal Improvement Committee.*

SIR, *Calcutta, 3d September,* 1838.

In reply to the questions proposed to me by the Fever Hospital and Municipal Improvement Committee, about the establishment of a Lying-in Hospital, I beg to offer my opinion as follows,—The number of the females, who are likely to avail themselves of the Lying-in Hospital, will be very few, owing to many insurmountable prejudices that prevail among all classes of the Natives, as to staying in Hospital. The very few that may enter such an Hospital are of the lowest classes of the Natives, as the *Haree, Coara, Bagdee, Dome*, and very poor Mussulman and Christian women. I therefore think that a Lying-in Hospital is not likely to flourish under the existing circumstances of the country, and that a Lying-in Ward, with twenty beds, may be attached to the intended Fever Hospital, for the benefit of those who may wish to avail themselves of it. Then, if the prospect of success presents itself, by a large number of applicants for admission to the Lying-in Ward, a Lying-in Hospital on a large scale might be established.

The monthly expense for the diet of each woman will be from 3 to 4 Rupees, and each of the lying-in women will require a female attendant to take care of the child. In case she be much exhausted after delivery, or severe inflammatory disease follows it, two attendants will be necessary, one to take care of the child, and the other to wait upon the mother. But, when the mother is able to take care of herself and of her child, there is no necessity of alloting an attendant exclusively to her service. Three or four female attendants should be in permanent employ in the Lying-in Ward ; but, when any extra hands for temporary service are necessary, they may be called in by those in permanent employ. There should be one Medical man, that is the Hospital Surgeon, one Apothecary, one Compounder, one Cook, one male Servant, and one Mather for the Lying-in Ward. The salary of the Apothecary will be from 60 to 80, of the Compounder from 16 to 20.

In order to fulfil the philanthrophick intention of the Committee, to save innumerable females of this country from the fatal consequences of puerperal diseases, and difficult delivery, a School of Midwifery should be attached to the Lying-in Ward, wherein females from 25 to 30 years old, and from 16 to 20 in number, should receive instruction, in the practical department of midwifery, from the Apothecary of the Lying-in Ward, through the medium of the vernacular tongue, under the superintendence of the Surgeon of the Lying-in Ward. The Apothecary should teach them the anatomy of the pelvis, and the female organs of generation, by the actual dissection of the human body. Clinical lectures will be delivered by the Hospital Surgeon, and the lectures should be interpreted by the Apothecary. It is desirable that the females to be educated should be widows. They must be initiated in reading and writing by the Compounder of the Lying-in Ward, and while thus situated they must attend upon the lying-in women. Their education should be so conducted that it must be finished in two years. The stipend for each of the females for the first year should be 4 Rupees, for the next year 5 Rupees. After two years' education, those that pass a satisfactory examination will receive certificates of proficiency ; and when a sufficient number of educated midwives is formed, the Committee should request the

Government to issue an order putting an end to the quack practice of midwives now in vogue, and allowing the educated women alone the exclusive privilege of practising midwifery. Thus a good systematick education of midwifery, aided by merited encouragement, will rapidly advance the cause of humanity, and millions of now helpless women will be rescued from the grave.

I have the honour to be, Sir,

Your most obedient Servant,

*(Signed)* MODOOSOODUN GOOPTO.

P. S. I have omitted to state that each woman during the time of delivery, and for five days after, will require a small separate apartment, screened off from being seen by partitions of 6 or 7 feet high, made of wood or canvas. After five days all Hindoo women, of the low castes which will go to the Hospital, and all the Mussulmanee women, may associate together; all the Hindoo and all the Mussulmanee women being in two distinct apartments, and apart from Christian. I think Mrs. Wilson's female pupils will be anxious to be some of them admitted students of midwifery. Hindoo women have no objection to Christian or Mussulmanee midwives if skilful, to act as midwives only.

*(Signed)* MODOOSOODUN GOOPTO.



## No. 28.

***Statement shewing the Monthly Expenditure in the Native Hospital, for Dieting, Country Medicines, and Sundries, for 12 years.***

| | 1826. | | | | 1827. | | | | 1828. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Charges for Dieting. | Charges for Country Medicines. | Charges for Sundries | Total. | Charges for Dieting. | Charges for Country Medicines. | Charges for Sundries. | Total. | Charges for Dieting. | Charges for Country Medicines. | Charges for Sundries. | Total. |
| January, | 208 3 6 | 455 1 6 | 242 13 0 | 906 5 0 | 253 1 9 | 490 15 6 | 203 1 0 | 917 2 3 | 237 12 9 | 476 13 0 | 451 5 0 | 1,168 14 9 |
| February, | 221 10 0 | 451 2 6 | 237 12 0 | 913 8 6 | 227 13 3 | 446 12 0 | 201 9 0 | 879 2 3 | 230 12 0 | 431 6 6 | 281 15 0 | 944 1 6 |
| March, | 237 3 6 | 168 7 6 | 180 14 0 | 886 9 0 | 241 7 3 | 488 5 0 | 121 3 3 | 850 15 6 | 213 14 9 | 429 13 0 | 146 5 0 | 790 0 9 |
| April, | 232 2 3 | 492 13 9 | 314 7 0 | 1,010 7 0 | 227 0 9 | 478 6 0 | 210 7 0 | 915 13 9 | 194 4 9 | 431 8 0 | 343 8 0 | 972 4 9 |
| May, | 212 12 3 | 416 2 6 | 140 6 0 | 799 4 9 | 241 15 6 | 489 2 0 | 202 12 0 | 933 13 6 | 220 0 9 | 402 8 3 | 235 2 0 | 857 11 0 |
| June, | 213 1 0 | 449 8 0 | 129 11 0 | 792 4 0 | 215 12 7 | 451 13 0 | 115 15 0 | 783 8 7 | 194 5 0 | 358 12 0 | 137 8 0 | 690 9 0 |
| July, | 237 7 3 | 459 6 3 | 106 0 0 | 802 13 6 | 228 15 6 | 455 5 3 | 123 12 0 | 808 0 9 | 205 12 3 | 359 13 9 | 236 9 0 | 802 3 0 |
| August, | 251 1 3 | 489 13 0 | 198 10 8 | 912 8 11 | 220 2 9 | 467 0 6 | 113 12 0 | 800 15 3 | 223 9 3 | 365 12 0 | 108 1 8 | 697 6 11 |
| September, | 255 1 6 | 515 13 6 | 107 8 0 | 878 7 0 | 238 10 6 | 457 4 6 | 119 3 0 | 815 2 0 | 233 2 0 | 361 14 6 | 122 7 0 | 717 7 6 |
| October, | 258 9 6 | 515 9 0 | 131 6 0 | 908 8 6 | 231 8 0 | 467 3 0 | 121 12 8 | 823 7 8 | 238 6 3 | 314 7 3 | 134 1 6 | 716 15 0 |
| November, | 259 1 9 | 492 11 6 | 227 11 0 | 979 11 3 | 222 5 1 | 455 12 0 | 199 15 0 | 878 0 1 | 209 11 3 | 346 0 6 | 280 13 0 | 836 11 9 |
| December, | 271 2 6 | 539 11 3 | 331 14 0 | 1,142 11 9 | 213 7 3 | 451 7 0 | 251 11 0 | 946 9 3 | 201 13 6 | 291 9 6 | 213 9 0 | 710 0 0 |
| Total, | 2,860 8 3 | 5,779 7 3 | 2,353 3 8 | 10,993 3 2 | 2,792 4 2 | 5,599 5 9 | 1,991 0 11 | 10,382 10 10 | 2,603 11 6 | 4,606 6 3 | 2,694 4 2 | 9,904 5 11 |

| | 1829. | | | | 1830. | | | | 1831. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January, | 208 1 9 | 293 13 3 | 171 15 0 | 673 14 0 | 216 0 6 | 164 15 6 | 260 0 9 | 611 0 9 | 144 6 6 | 98 6 9 | 81 11 0 | 327 8 3 |
| February, | 147 11 6 | 221 7 6 | 125 8 0 | 497 11 0 | 203 2 0 | 123 15 9 | 61 11 0 | 391 15 9 | 118 4 9 | 85 13 0 | 199 15 0 | 434 0 9 |
| March, | 162 4 6 | 231 1 3 | 75 5 0 | 471 10 9 | 193 15 9 | 126 12 3 | 81 0 0 | 404 12 0 | 140 4 3 | 84 8 6 | 37 14 0 | 262 10 9 |
| April, | 157 11 9 | 210 5 3 | 76 9 0 | 444 13 0 | 177 2 6 | 110 13 6 | 51 5 0 | 342 5 0 | 166 10 9 | 91 4 9 | 68 7 6 | 326 7 0 |
| May, | 173 7 3 | 191 8 6 | 129 8 0 | 497 7 9 | 187 9 3 | 114 10 6 | 125 1 0 | 427 4 9 | 142 9 2 | 89 10 10 | 38 6 6 | 270 10 6 |
| June. | 175 11 6 | 203 5 6 | 181 2 0 | 563 6 0 | 180 10 3 | 102 8 3 | 85 12 0 | 368 14 6 | 110 7 2 | 84 6 0 | 29 7 0 | 254 4 2 |
| July, | 178 11 0 | 181 15 9 | 80 0 0 | 443 10 9 | 198 10 3 | 115 1 0 | 76 8 0 | 390 6 3 | 155 9 0 | 102 11 6 | 84 13 8 | 313 2 2 |
| August, | 182 12 11 | 205 1 0 | 99 4 0 | 487 1 11 | 181 3 9 | 103 1 9 | 120 3 6 | 407 9 0 | 160 0 5 | 117 13 4 | 41 14 6 | 319 12 3 |
| September, | 177 8 9 | 192 10 0 | 67 10 0 | 437 12 9 | 165 13 3 | 99 13 0 | 21 8 0 | 287 2 3 | 177 11 9 | 125 12 3 | 35 9 0 | 339 1 0 |
| October, | 195 3 0 | 172 10 6 | 59 1 0 | 427 1 6 | 163 12 3 | 101 9 0 | 53 1 0 | 318 6 3 | 182 8 11 | 108 7 6 | 46 12 6 | 337 12 11 |
| November, | 183 5 3 | 171 11 3 | 169 11 0 | 525 1 6 | 119 12 9 | 98 0 9 | 33 7 0 | 281 4 6 | 167 12 3 | 129 7 9 | 121 15 0 | 422 3 0 |
| December, | 195 4 9 | 183 11 0 | 237 5 6 | 616 5 3 | 143 1 6 | 96 7 3 | 81 12 0 | 321 4 9 | 162 1 9 | 132 11 1 | 112 6 6 | 407 3 4 |
| Total, | 2,138 14 11 | 2,171 7 9 | 1,176 4 6 | 6,086 11 2 | 2,163 11 0 | 1,357 15 6 | 1,060 8 3 | 4,582 5 9 | 1,888 6 8 | 1,251 1 3 | 905 4 2 | 4,044 12 1 |

| | 1832 | | | | 1833. | | | | 1834. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January, | 160 5 6 | 130 15 0 | 28 10 0 | 319 11 6 | 123 15 0 | 106 0 3 | 193 9 6 | 423 8 9 | 163 6 2 | 140 6 11 | 35 12 6 | 339 9 7 |
| February, | 163 7 9 | 133 15 3 | 181 13 0 | 479 4 0 | 117 6 3 | 98 15 9 | 46 15 6 | 263 5 6 | 135 9 2 | 123 7 9 | 63 13 0 | 322 13 11 |
| March, | 173 9 0 | 145 15 3 | 45 4 0 | 364 12 3 | 126 5 0 | 120 2 6 | 37 5 0 | 283 12 6 | 154 4 6 | 131 5 0 | 29 6 0 | 314 15 6 |
| April, | 150 10 9 | 132 8 3 | 36 11 0 | 320 1 0 | 125 3 3 | 117 8 9 | 20 14 0 | 263 10 0 | 154 1 3 | 127 0 1½ | 31 0 0 | 315 1 4½ |
| May, | 154 3 3 | 131 8 0 | 73 6 6 | 362 1 9 | 135 1 9 | 128 15 3 | 51 11 6 | 315 12 6 | 162 12 0 | 128 1 7 | 45 11 6 | 336 9 7 |
| June, | 142 5 0 | 125 7 0 | 47 8 6 | 315 4 6 | 132 6 3 | 123 15 6 | 36 7 0 | 292 12 9 | 150 10 10 | 147 11 11 | 26 3 0 | 324 9 9 |
| July, | 151 3 9 | 127 15 3 | 23 0 6 | 302 3 6 | 137 10 0 | 133 4 0 | 29 3 6 | 300 1 6 | 172 15 4 | 141 11 4 | 28 15 0 | 343 9 8 |
| August, | 146 11 9 | 120 10 0 | 53 13 8 | 321 3 5 | 143 13 8 | 131 6 1 | 26 4 6 | 301 8 3 | 180 1 ½ | 129 10 5 | 113 7 11 | 423 3 4½ |
| September, | 156 13 0 | 135 4 9 | 22 3 6 | 311 5 3 | 176 7 10 | 141 12 9 | 20 10 0 | 338 11 7 | 158 11 0 | 123 15 9 | 21 15 6 | 307 10 3 |
| October, | 159 15 6 | 124 3 6 | 21 0 0 | 308 3 0 | 173 4 7 | 131 13 5 | 52 9 0 | 357 11 0 | 117 1 0 | 120 7 6 | 17 6 6 | 281 15 0 |
| November, | 151 8 10 | 111 8 5 | 125 3 0 | 418 4 3 | 156 3 10 | 111 5 5 | 118 15 0 | 386 8 3 | 140 8 3 | 102 7 3 | 122 9 0 | 365 8 6 |
| December, | 143 3 9 | 119 5 6 | 21 11 9 | 287 8 0 | 170 15 3½ | 125 11 5½ | 130 8 0 | 427 5 9 | 139 1 6 | 159 12 3 | 36 4 3 | 335 2 0 |
| Total, | 1,851 1 10 | 1,572 1 2 | 686 11 5 | 4,113 1 5 | 1,718 12 8½ | 1,471 1 1½ | 765 1 6 | 3,951 15 4 | 1,859 2 ½ | 1,576 1 9½ | 578 8 2 | 4,013 12 0 |

| | 1835. | | | | 1836. | | | | 1837. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January, | 142 3 9 | 138 8 0 | 121 2 6 | 401 14 3 | 112 9 2 | 81 8 6 | 12 15 9 | 210 1 5 | 101 12 1 | 101 9 7 | 25 5 0 | 228 10 8 |
| February, | 112 6 3 | 116 2 9 | 61 10 3 | 320 3 3 | 109 9 10 | 83 12 2 | 12 12 0 | 206 2 0 | 113 12 1 | 99 11 7 | 31 5 6 | 247 13 2 |
| March, | 145 8 6 | 117 15 6 | 37 7 0 | 300 15 0 | 111 15 5 | 88 0 9 | 11 3 0 | 211 3 2 | 128 6 5 | 101 6 10 | 15 1 9 | 244 15 0 |
| April, | 112 15 5 | 86 8 9 | 19 0 4 | 218 8 6 | 101 15 0 | 85 10 6 | 78 1 6 | 268 11 0 | 135 15 10 | 103 9 3 | 106 2 3 | 345 11 4 |
| May, | 129 11 3 | 82 8 1 | 23 3 9 | 235 7 1 | 111 4 8 | 105 0 5 | 54 4 0 | 273 9 1 | 136 4 10 | 108 0 10 | 17 11 6 | 262 1 2 |
| June, | 121 6 7½ | 96 8 3 | 53 5 3 | 271 4 1½ | 121 9 9 | 103 12 8 | 29 15 9 | 255 6 2 | 129 13 8 | 107 9 8 | 48 10 0 | 281 1 4 |
| July, | 135 0 0 | 91 6 4 | 36 0 0 | 265 6 4 | 123 12 7 | 89 13 5 | 20 3 6 | 233 13 6 | 119 9 3 | 108 5 11 | 74 4 9 | 302 3 11 |
| August, | 122 1 11 | 93 15 0 | 60 15 0 | 276 15 11 | 114 0 9 | 91 6 0 | 16 12 6 | 225 3 3 | 123 7 10 | 115 11 0 | 35 0 0 | 271 2 10 |
| September, | 120 14 6 | 87 13 1 | 13 10 0 | 222 5 7 | 111 14 10 | 95 9 8 | 17 12 0 | 228 4 6 | 96 12 0 | 113 4 5 | 28 0 0 | 238 0 5 |
| October, | 121 5 11 | 101 15 0 | 46 3 2 | 269 8 1 | 123 7 4 | 102 9 10 | 110 4 9 | 336 5 11 | 111 9 11 | 102 2 1 | 77 2 9 | 290 14 9 |
| November, | 113 4 4 | 99 15 0 | 53 1 3 | 266 1 7 | 135 7 1 | 96 5 0 | 50 6 3 | 282 2 7 | 105 9 7 | 106 8 0 | 82 7 0 | 294 8 7 |
| December, | 115 8 7 | 91 1 11 | 12 9 6 | 222 4 0 | 96 7 3 | 93 9 6 | 45 0 3 | 235 1 0 | 125 10 10 | 102 0 3 | 36 3 6 | 263 14 7 |
| Total, | 1,522 7 0½ | 1,210 5 8 | 538 4 0 | 3,271 0 8½ | 1,383 1 11 | 1,123 2 5 | 459 11 3 | 2,965 15 7 | 1,428 12 1 | 1,269 15 5 | 575 6 0 | 3,271 1 9 |

### ABSTRACT.

| Years. | Amount. Rs. | As. | P. | Annual No. of House Patients. |
|---|---|---|---|---|
| 1826 | 10,993 | 3 | 2 | 505 |
| 1827 | 10,382 | 10 | 10 | 484 |
| 1828 | 9,904 | 5 | 11 | 549 |
| 1829 | 6,086 | 11 | 2 | 499 |
| 1830 | 4,582 | 5 | 9 | 441 |
| 1831 | 4,044 | 12 | 1 | 382 |
| 1832 | 4,113 | 1 | 5 | 492 |
| 1833 | 3,951 | 15 | 4 | 482 |
| 1834 | 4,013 | 12 | 0 | 901 |
| 1835 | 3,271 | 0 | 8½ | 1,023 |
| 1836 | 2,965 | 15 | 7 | 956 |
| 1837 | 3,274 | 1 | 9 | 990 |

Prepared by P. O'BRIEN, *1st Assistant, Native Hospital.*

Examined, J. R. MARTIN, *Surgeon, Native Hospital.*

*June 15th*, 1838.

# No. 29.

*Questions to which Answers are requested by the Fever Hospital and Municipal Committee from*

J. R. MARTIN, ESQUIRE,

*Surgeon to the Native Hospital.*

Q. 1. You have been pleased to deliver to the Committee an Account of the Expenses of the Native Hospital, and of the number of Patients admitted in each year from 1826 to 1837. Are you able to state to the Committee the causes of the great disproportion in the expense, as compared with the number of patients in the years previous to the year 18 , and that incurred in the subsequent years of the period? When was your attention first called to the subject, and in what circumstances?

*A.* Soon after my nomination to the Native Hospital, I was informed of the existence of excessive overcharging on the part of the then Hospital Sirkar, whose duty it was, under the check of the Secretary, to supply articles of Diet, Country Medicines, &c. for the use of the Institution. My information I considered sufficient to warrant the immediate suspension of the Sirkar on my own responsibility, and without reference to the Hospital authorities; but after two months trial of another Sirkar, I submitted the result to a Committee of the Governours of the Institution, when the old Sirkar was convicted of enormous fraud, and dismissed. I must here mention, that the Secretary is the only economic officer of the Institution, and that at the time I speak of, he had a Sirkar expressly to check the Hospital Sirkar, in aid of his own experience. This system worked very badly; and the moment I satisfied myself that such was the case (though not forming any part of my duty as Surgeon of the Institution) I acted as above mentioned, and brought the whole to the notice of the Governours. After two years trial of the new Sirkar, I found him treading closely on the heels of his predecessor, and having convicted him also before the Governours, he was dismissed. I then suggested the plan acted on for the last four years, namely the supplying the Hospital by the First Assistant, under a declaration, similar to that used in the Commissariat Department. The plan has worked even beyond my expectations, and the extraordinary disproportion between the old and the new rates of charge, is the true result.

Q. 2. What means have been employed to effect a reduction of expense? and to what circumstances do you attribute the increase in the number of Patients?

*A.* The means employed to effect reduction have been noticed in answering the economic portion of the last question. The executive duty has been solely carried through by Mr. O'Brien, the First Assistant, whose intelligence and activity have been most extensively useful to the Institution. Country Medicines under the original Sirkar averaged Rs. 500 for 300 In-Patients, whereas the cost now is Rs. 110 with 1000 patients. The increase in the number of patients I ascribe to the growing confidence of the Natives in European consideration towards them, and in their Medical management particularly.

*Q.* 3. The Committee understand that you served for several years in the General Hospital, in a Medical capacity. For how many years, and in what capacities did you serve there?

*A.* I served several years in the General Hospital as officiating first permanent Assistant, in 1819-20; afterwards as permanent first Assistant, in 1826-7 and 8; I also did duty in the portion of the buildings of the General Hospital allotted to the European troops of the Royal Army, when serving with Her Majesty's 17th and 59th Regiments in 1818-19.

Within the last six years likewise, I officiated as Surgeon to the General Hospital.

Q. 4. Was it, in your opinion, well constructed for an Hospital? Has it been since, to your knowledge, altered in any respect? And what, in your opinion, are its excellencies or defects as an Hospital, in the climate of Calcutta, in point of situation, aspect, airiness and construction?

*A.* I shall speak of the buildings separately; and first, of that used for the General Hospital. It was 70 years ago a private dwelling, a description of building that has seldom or never been susceptible of being made a good Hospital in any country. The lower floor is close upon the ground, necessarily damp in such a climate; and both from the lowness of the roof, and situation of the adjoining wings, its ventilation is imperfect. The upper range is but little better. It is, in short, a badly constructed Hospital. The wings allotted to Her Majesty's troops were considered by the late Dr. Burke, Inspector-General of Hospitals, as unfit for the reception of the sick, and the Committee which especially examined the buildings in July, 1826, reported to the same effect.—All I know of them obliges me to coincide in that opinion. The locality is close upon Bhowaneepore, one of the worst of our Suburbs, and the Hospital buildings are surrounded by a wall sixteen feet high, as if on purpose to obstruct ventilation. The buildings have not been improved since I served in them;—indeed, I question whether plans, originally so faulty, can be effectually improved.

Q. 5. Is the present Native Hospital sufficiently large, in your opinion, to supply the demand among the Native poor of Calcutta for Surgical assistance; and if not, what addition do you think it would be necessary to make thereto?

*A.* The present Hospital is not large enough for the wants of the Native community, even if limited to its proper Surgical purposes.

Q. 6. Is it in your opinion well and healthily situated for an Hospital, or if in any degree otherwise, in what respects?

*A.* It is centrally situated in reference to population and Native convenience; but the crowded state of the Town immediately around the Hospital, seriously obstructs ventilation. The Chandny Bazar is within sixteen feet of the Hospital, and, as stated by me on another occasion, I consider the enlargement of space around, necessary to secure the prosperity of the Institution. Nothing but extreme care keeps us clear of Hospital gangrene, and the sloughing of all sores.

Q. 7. It is understood you have only one Ward; what are its dimensions? Is it sufficiently spacious and airy for the number of patients it is intended to receive; and what is this number?

*A.* There is a central ward of 118 by 19½ feet, with a north and south verandah, 19½ feet wide, divided from the ward by pillars—To the east and west of this ward are walled off one, for the accommodation of females, 12½ feet by 39 feet; and the other for a Dispensary and Operating Room. These divisions being after-thoughts, and forming

no part of the original plan, are very defective, especially the female ward. The central ward also being insufficient in space, we are obliged all the year round to fill the northern verandah with beds, which should never be the case. We do accommodate fifty patients, but the number proper to us is forty. The building is not sufficiently raised off the ground, nor is it sufficiently lofty.

*Q.* 8. Are there any separations in the ward, to divide different religions and castes, in a manner rendered necessary by Native observances? How many of these divisions are there, and how appropriated? And in particular, how many for separate castes of Hindoos?

*A.* There are no separations, but those already mentioned.

*Q.* 9. How are the partitions constructed? And are the divisions sufficient in number and completeness effectually to answer the purposes of separation, required by Native customs?

*A.* The partition dividing the small female room from the Hospital is of brick-work, and rises to the roof of the building, thus obstructing ventilation.

(*Signed*) J. R. MARTIN.

NATIVE HOSPITAL,
*September 15th*, 1838.

## No. 30.

*Additional Queries put to*

J. R. MARTIN, ESQUIRE,

*Native Hospital, 29th September*, 1838.

*Q.* 1. Are there any records kept at your Hospital of the several descriptions of disease under which the patients labour that are admitted, of the dates of their admission and discharge, or demise, and if discharged whether cured, or relieved, or incurable? And are there any records of the various types, progress, remission, endurance and termination of the several diseases, and of the Medical treatment and its effect, so kept as to afford the means of forming accurate conclusions in Medical science in regard to the various diseases incident to the climate and locality, or influenced by them?

*A.* The description of diseases, the dates of admission and discharge, or decease, the nature and extent of the cures are all stated; but the other points described in the question are not sufficiently particularized to afford the proper kind of information required in the all-important department of Hospital statistics. The Native Hospital being a Surgical Institution, has some excuse in this respect; but none can be found for the neglect of it in other Institutions. I tried lately to arouse attention to this great question in Medical science, and to arrange and fix the plans of all the Bengal Hospital records so as to yield the required results, which they do not do now; but I regret to say I was obstructed where I might least expect it, and so the plan is dropt for the present. It cannot however long remain obstructed; the question is of vast importance, and must soon obtain the attention it deserves.

*Q.* 2. If the records afford you the means of stating it with accuracy, or if the records, or your own observation enable you to state it with a reasonable approach to accuracy, be pleased, in either case, to state what may be taken as the average number per diem for the five years ending in 1837, of the patients inhabiting the Hospital.

*A.* The average number of patients in the Hospital per diem during the last five years may be stated at 40; but this can only be given as an approximation to the truth.

P. S. In order to enable the Committee or any man of business, to form his own opinion on the interesting and important subject of Hospital statistics, I beg to forward a few memoranda of an elementary nature; and also two forms of Hospital Returns, one for the Royal, and the other for the Honourable Company's Hospitals.

*Q.* 3. Were you acquainted with the late Dr. Burke, Inspector-General of Military Hospitals for Her Majesty's Service in India? Are you acquainted with the circumstances which led him to apply to the Government of Bengal to erect a new Hospital for Her Majesty's troops, in lieu of the wing of the General Hospital then and still occupied by them? Do you know his opinion of the present General Hospital in respect to its being well adapted or otherwise to the purposes of an Hospital in the climate and locality of Calcutta; and in what respects, and to what extent, he considered it defective?

*A.* I had the pleasure of a long personal acquaintance with the late Dr. Burke, Inspector-General of Hospitals. I knew him first at the Isle of France, and afterwards during the whole of his residence in Bengal. He was an officer of uncommon talent, and of varied and extensive experience. He at once condemned the General Hospital buildings, as unfit for the reception of the sick; and in July, 1826, that portion of the buildings occupied by the soldiers of Her Majesty's Service was reported on by a Committee so very unfavourably, that another was ordered to be erected instead.

In a letter of Dr. Burke's to Lord William Bentinck, I find as follows: "The Hospital for H. M. troops in Calcutta, is ill ventilated and low, as to the upper story's ceiling, and still more so as to the under; and the wards in it are always so crowded that it becomes necessary to fill the verandahs with sick." Beyond crowding, the most unfavourable of all circumstances for sick. I know that Dr. Burke, considered the Hospital ill located, and in every way a bad Hospital.

*Q.* 4. The Committee are informed that the New Hospital for the Queen's troops, now occupied as the Court House of the Sudder Dewanny and Nizamut Adalut, was executed under the inspection and after a plan of Dr. Burke's. Are you acquainted with the reasons which governed him in that plan; the objects he desired to attain, and the evils he desired to avoid in this climate and locality; and do you know the new building sufficiently to give an opinion whether, and to what degree, he succeeded in his design; and whether the structure erected by him would form an Hospital superior to that now occupied by the Queen's troops being part of the General Hospital buildings, and in what respects, and in what degree?

*A.* The reasons that governed Dr. Burke in his plan of the New Hospital were, the securing a freer exposure and ventilation, and the procuring a more spacious, lofty, and better raised place of accommodation for the sick; and it was the absence of all these in the old buildings of the General Hospital, that made him desire to escape from them. The Hospital erected on Dr. Burke's plan, and now occupied by the Sudder Dewanny, is so superior to any of the General Hospital buildings, that no one can be found to compare them as places of accommodation for sick.

I have often visited Dr. Burke's Hospital, and think it a fine sample of what an Hospital in Bengal ought to be.

(*Signed*) J. R. MARTIN.

## No. 30. (A)

*November 17th,* 1838.

DEAR SIR,

I have the pleasure to send you some amended rules for Hospital Statistics, arranged by me from the writings of Mr. Edmond and Mr. Farr. They are such as will render Medical and Financial Calculation simple and easy to any one.

Yours truly,

J. R. MARTIN.

To THE HONBLE. SIR J. P. GRANT.

## No. 30. (B)

### ELEMENTS OF HOSPITAL STATISTICS.

1st. The average *daily* number of patients in the House is the most important element in a report. It is this alone, and not the total number of yearly admissions, which regulates the expenditure. The expense of a family depends on the number of its inmates, and not at all on the number of times these inmates are changed; and this principle applies in all its force to Hospitals. If this was merely a financial question, if it only enabled the trustees to compare the cost of one year with that of another, or the expenses of different Institutions placed in similar circumstances, it would not be unimportant; but a knowledge of the average daily number of patients living within the walls, is the key-stone of all possible statistical inquiries relating to Hospitals. Without this, the proportions of deaths collected by various writers are illusory, and have every where led to erroneous conclusions.

2d. The average number of patients resident is best ascertained by counting the number in the house every day of the year, and dividing the sum of the whole by 365; or by repeating the addition every week, and dividing the sum by seven. This is doubtless exceedingly simple, but unfortunately it has not been practised, and it is still overlooked by reporters. The days of treatment in the year ascertained by adding together the number of patients in the house every day, would alone be of great value.

3d. The time of residence in European Hospitals varies from 28 to 102 days, and as the difference is still greater in some, a comparison of mortality in such circumstances is absurd; unless the *time* is reduced to some unity, the relative intensity of mortality cannot possibly be compared.

In the ordinary tables of mortality, the unity of time is one year; 36·5 days i here preferred, because it is near the average term of residence, and being the tenth of the year,

can be readily compared with the ordinary tables by changing the decimal place; thus the average deaths for 36·5 days, in 21 Hospitals, are 4-12 per cent.; for 365 days, 41-2 in 100 constantly living.

4th. The days of treatment divided by the number of deaths, exhibits the relation of sick time to each death.

5th. Dividing the total deaths by the number treated, exhibits the mortality of cases.

6th. Dividing the yearly deaths by the average under treatment, gives the rate of mortality in 36·5 days. Thus the deaths out of a given number, in a given time, can be compared at different Institutions; the mortality of the sick may be compared with that of the total population; and, moreover, 36·5 days, is an approximation to the mean duration of severe cases.

7th. The average number under treatment multiplied by 365¼, and divided by the total number treated, presents the mean term of treatment in days.

8th. It is always desirable to ascertain the influence of age and sex in the production of disease; but neither this, nor the influence of age and sex in modifying the effects of treatment, can ever be accomplished until the proportion of each sex, and the ages of the patients are known—a self-evident truth, which writers on these subjects have never taken into account.

9th. From the numbers *admitted* at each age—for instance, 20, 30, 40 and 50—and the enumeration of the number *under treatment* at the same intervals of age, it may be ascertained to what extent the term of treatment varies with the age of the patients.

If for 100 treated in the year, between the ages 20, 30, ten remained constantly under treatment, and for 100 admitted between the ages 40, 50, fifteen remain on an average, it would follow that the patients aged 20, 30 remained 36½ days; the patients aged 40, 50, half as long again, or 54¾ days. The ages of the patients admitted in quinquennial periods of life should therefore be published; and, in addition to this, the mean number at the same ages constantly under treatment deducted from twelve annual enumerations made on the first day of every month.

10th. The expenditure in food, fire, salaries, and wages, divided by the average number of resident patients, presents the relative cost.

11th. Independently of Medicines (perhaps 1¼*d.*) the daily maintenance of each patient in the English Hospitals averages 1*s.* 3¼*d.* This includes all the salaries, and the maintenance of the resident servants, nurses, and officers, who in an Hospital of 90 patients, generally amount to 15, or one to six patients.

12th. The observations of one year are not sufficiently numerous to authorize any very general inferences; nevertheless a few remarks may be offered, as the fluctuations in the proportion of deaths, and other apparently uncertain items, are less extensive than persons unacquainted with statistics suppose.

13th. One year will not give the average mortality. To determine this, five years observation at least would be required—ten will give a true result.

14th. The causes of a high rate of mortality are bad localities and crowding, the most unfavourable of all circumstances for sick; severe accidents, and generally the diseases of large towns, and the selection exercised in admitting patients.

15th. Let it not for a moment be supposed that those are always the most useful institutions in which the mortality is lowest; the contrary is often the case. The nature of the diseases treated is the true key. An Hospital full of acute diseases will necessarily have a larger ratio of mortality under the best of human management; whereas one filled with mild cases, if under the care of nurses, will have a small ratio of mortality, and so will a Surgical Hospital under ordinary care. The cheapest Hospitals too, are not always the best.

16th. It is justly observed by Mr. Edmond that the facts contained in Medical statistics are "the central points of the science of medicine, and that it is only through observations on collective vitality, that any precise or numerical knowledge can be obtained respecting the laws of individual vitality. The only sure index of the practical success of the science of medicine is in the increase of collective vitality, or in the diminution of collective mortality."

J. R. MARTIN.

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# No. 31.

*Information required by the Chairman of the Fever Hospital and Municipal Committee from the Secretary to the Native Hospital.*

*Query* 1st. In what year was the Native Hospital established? By what means? With what funds? And for what purpose?

*Answer.* In 1794. By Private Donations. With Sa. Rs. 66,514 : 6 : 1. For the relief of sick and maimed Natives.

Q. 2d. What additions have been made to its vested funds since its first establishment, by Will or Donations, distinguishing the names of the Testators or Donors, but not including Government Donations or annual Subscriptions?

*A.* Legacies.

On the 20th July, 1814, the Accountant General of the Supreme Court made to the Treasurers of the Native Hospital the first payment of the Legacy of the late Mr. John Barretto, Sa. Rs. 1,850.

In 1815, 1,900 Rs. by half-yearly payment till 1816.

In 1817, it was decreased to 1,725 : 4 : 4, half-yearly, and is continued at that rate up to the present date.

These fluctuations were consequent on the rate of interest paid by Government on their securities. The Secretary submits to the Accountant General of the Supreme Court half-yearly a formal statement, shewing the expenditure of each payment of Legacy before the next is received.

On the 5th July, 1830, the late Doctor John Fleming left the Institution a sum of 9,825 Sa. Rs. On the 1st August, 1837, the late Mr. Francis Mendes left to the Institution Sa. Rs. 2,000 less legacy duty to the Crown, and charges for drawing Releases in duplicate to the Executors, Co's. Rs. 1,825 : 13 : 8.

On the 14th August, 1838, the late General Lewis Thomas' Legacy from 1825-26 to 1837-38, being 13 years, at 100 Sa. Rs. per annum, Sa. Rs. 1,300.

The late Mr. John Athanass having left a Legacy of 1,000 Sa. Rs. to the Institution, which was announced by the Registrar of the Supreme Court on the 29th June, 1836, but as yet no payment has been received. The amount of Legacies received has never been kept distinct, but carried into the General Funds of the Native Hospital by the Treasurers, Messrs. Alexander & Co. No authority for doing so appears on the Books of the Institution.

## *Private Donors.*

### 1792.

| | | | | |
|---|---|---|---|---|
| Dec. 13, | J. H. Harrington, .. | 100 | 0 | 0 |
| —— 19, | Cockerell, .. .. | 600 | 0 | 0 |
| —— | Charles Chapman, .. | 820 | 0 | 0 |

### 1793.

| | | | | |
|---|---|---|---|---|
| Jan. 25, | Rungpore Subscript., | 459 | 0 | 0 |
| Feb. 2, | Marquis Cornwallis, | 3,000 | 0 | 0 |
| —— | Peter Speke, .. .. | 1,500 | 0 | 0 |
| —— | H. Cowper, .. ... | 1,500 | 0 | 0 |
| —— | D. Vanderhoydon, .. | 500 | 0 | 0 |
| —— | G. Dowdeswell, .. | 500 | 0 | 0 |
| —— | Rev. John Owen, .. | 600 | 0 | 0 |
| —— | Tumlook Subscription, by Mr. Dent, | 2,514 | 0 | 0 |
| —— | Geo. & Thos. Gowan, | 200 | 0 | 0 |
| —— | Fairlie, Reed and Co. | 500 | 0 | 0 |
| —— 5, | Robt. Stuart, .. .. | 160 | 0 | 0 |
| —— | Cockerell and Co. .. | 200 | 0 | 0 |
| —— | G. Gillet, .. .. .. | 250 | 0 | 0 |
| —— | H. Edwards, .. .. | 100 | | 0 |
| —— | Fairlie and Co. .... | 500 | 0 | 0 |
| —— | Sarkies Johannes, .. | 400 | 0 | 0 |
| —— | Udny, Frushard & Co. | 300 | 0 | 0 |
| —— | William Larkins, .. | 500 | 0 | 0 |
| —— | C. R. Cromelin, ... | 300 | 0 | 0 |
| —— 8, | E. O. Eves, .. .. | 200 | 0 | 0 |
| —— | Myrody Kyrikos, .. | 100 | 0 | 0 |
| —— 12, | The Hon. C. Stuart, | 1,500 | 0 | 0 |
| —— | Beerbhoon Subscript. | 698 | 0 | 0 |
| —— | S. Heatly, Purneah, | 1,095 | 0 | 0 |
| —— | Colonel Martin, .. | 200 | 0 | 0 |
| —— | Rev. Mr. Blanchard, | 600 | 0 | 0 |
| Mar. 1, | R. Bathurst, .. ... | 500 | 0 | 0 |
| —— | G. Arbuthnot, .... | 300 | 0 | 0 |
| —— | J. L. Chauvet, .... | 150 | 0 | 0 |
| —— | Ahmud Addy Khaun, | 100 | 0 | 0 |
| —— | J. Gentel, ..... | 100 | 0 | 0 |
| —— | R. Parris, .. .. .. | 100 | 0 | 0 |
| | Carried over, Sa. Rs. | 21,146 | 0 | 0 |

### 1793.

| | | | | |
|---|---|---|---|---|
| | Brought over, Sa. Rs. | 21,146 | 0 | 0 |
| Mar. 1, | Sir John Shore, .. | 2,000 | 0 | 0 |
| —— | J. D. Gooch, .. | 100 | 0 | 0 |
| —— | E. Frazer, .. .. | 100 | 0 | 0 |
| —— 14, | G. Udny, ... ... | 679 | 0 | 0 |
| April 2, | Jas. Barretto, .. | 1,000 | 0 | 0 |
| —— | J. Forbes, ... .. | 100 | 0 | 0 |
| —— | H. Trail, .. .. | 200 | 0 | 0 |
| —— 3, | A. Lambert, ... .. | 500 | 0 | 0 |
| —— | R. Holmes, .. .. | 100 | 0 | 0 |
| —— | David Ross, .. .. | 200 | 0 | 0 |
| —— | Colonel Ross, .. | 500 | 0 | 0 |
| —— | Colvin, Bazette & Co. .. .. | 100 | 0 | 0 |
| —— | R. S. Perreau, .. | 100 | 0 | 0 |
| —— | J. Palling, .. .. | 100 | 0 | 0 |
| —— | C. Shakespear, .. | 100 | 0 | 0 |
| —— | T. Maccan, .. .. | 530 | 0 | 0 |
| —— 9, | Robt. Wilson, .. | 1,000 | 0 | 0 |
| —— 12, | E. Barrow, .. .. | 600 | 0 | 0 |
| —— | Robt. Tomlinson, | 200 | 0 | 0 |
| —— 13, | J. Willis, .. .. | 500 | 0 | 0 |
| —— 15, | Dr. John Fleming, | 500 | 0 | 0 |
| —— 20, | J. Luard, .. .. | 500 | 0 | 0 |
| —— 25, | J. Wilton, .. .. | 150 | 0 | 0 |
| —— 27, | W. Wilkinson, .. | 1,015 | 0 | 0 |
| —— 29, | C. Chapman, .. | 300 | 0 | 0 |
| —— 30, | J. Grant, .. .. | 300 | 0 | 0 |
| May 1, | John Buller, ... | 500 | 0 | 0 |
| —— | William Douglas, | 200 | 0 | 0 |
| —— | Ditto Ditto, .. | 559 | 0 | 0 |
| —— | Bank of Hindostan, | 400 | 0 | 0 |
| —— 3, | G. C. Mayer, .... | 500 | 0 | 0 |
| —— 14, | E Tiretta, .. .. | 100 | 0 | 0 |
| —— 15, | Wm. Smoult, .... | 700 | 0 | 0 |
| —— | Geo. Thompson, ... | 100 | 0 | 0 |
| —— 30, | Edmonstone and Davidson, .. | 317 | 0 | 0 |
| | Carried over, Sa. Rs. | 35,996 | 0 | 0 |

## 1793.

| | | | | |
|---|---|---|---|---|
| | Brought over, Sa. Rs. ... | 35,996 | 0 | 0 |
| June 3, | KissenKhauntSen, | 500 | 0 | 0 |
| —— 12, | Commercolly Subsc. | 350 | 0 | 0 |
| —— 13, | C. Barber, ....... | 478 | 0 | 0 |
| —— | Barber & Collinson, | 289 | 0 | 0 |
| —— 13, | Geo. Hatchfine, .. | 13 | 5 | 6 |
| —— 15, | R. Bruce, .. .. | 100 | 0 | 0 |
| —— | G. Johnstone, ..... | 200 | 0 | 0 |
| —— | H. R. Hewett, .. | 400 | 0 | 0 |
| —— | James Orr, .. .. | 100 | 0 | 0 |
| —— | Capt. Whetherstone, | 100 | 0 | 0 |
| —— 22, | M. Atkinson & Co., | 200 | 0 | 0 |
| —— | Lewis and Morris, | 200 | 0 | 0 |
| July 1, | C. A. Burce, .. .. | 750 | 0 | 0 |
| —— 9, | Dr. Bainbridge, .. | 200 | 0 | 0 |
| —— 4, | P. Redhead and Co., | 200 | 0 | 0 |
| —— 17, | Jonathan Duncan, | 400 | 0 | 0 |
| —— | C. Oldfield, .. .. | 100 | 0 | 0 |
| —— | J. E. Harrington, .. | 200 | 0 | 0 |
| —— 23, | Edmond Morris, .. | 200 | 0 | 0 |
| —— | John Elliott, .. .. | 200 | 0 | 0 |
| —— | J. H. Harrington, .. | 260 | 0 | 0 |
| —— | Natives. *Natore*, .. | 296 | 0 | 0 |
| —— | F. Smith, .. .. | 200 | 0 | 0 |
| —— | Major Dunn, .. .. | 200 | 0 | 0 |
| —— | Dr. William Dick, | 300 | 0 | 0 |
| —— | Captain J. Blythe, | 200 | 0 | 0 |
| —— | S. Beachcroft, .. .. | 275 | 0 | 0 |
| —— 30, | Sarkies Johannes, | 1,000 | 0 | 0 |
| —— | McGuire, .. .... | 200 | 0 | 0 |
| Aug. 3, | Armenian Subscrip. | 494 | 0 | 0 |
| —— 8, | H. Buller, .. .... | 200 | 0 | 0 |
| —— 10, | W. N. W. Hewett, | 446 | 0 | 0 |
| —— 12, | Thos. Boileau, .... | 100 | 0 | 0 |
| —— | Cash collected at Cawnpore, .. | 115 | 0 | 0 |
| —— | Gunganarain Doss, | 468 | 0 | 0 |
| —— 22, | T. Baring, .... .. | 100 | 0 | 0 |
| —— 24, | T. Spottiswood, .. | 600 | 0 | 0 |
| Sept. 5, | Colvin and Co. .. | 780 | 0 | 0 |
| —— 10, | Bissumber Pundit, | 500 | 0 | 0 |
| —— 28, | G. H. Barlow, ..... | 500 | 0 | 0 |
| —— | Doncaster, .. .... | 200 | 0 | 0 |
| Oct. 5, | Goudard, .. .. .. | 500 | 0 | 0 |
| —— | Monohun Doss, .. | 500 | 0 | 0 |
| —— 19, | J. L. Chauvet, .. | 160 | 0 | 0 |
| Dec. 14, | W. .. .. .. | 60 | 0 | 0 |
| | Carried over, Sa. Rs. .. | 49,880 | 5 | 6 |

## 1794.

| | | | | |
|---|---|---|---|---|
| | Brought over, Sa. Rs. .. | 49,830 | 5 | 6 |
| Jan. 7, | Sir Wm. Jones, .. | 500 | 0 | 0 |
| —— 17, | F. Pierard, .. .... | 100 | 0 | 0 |
| —— | Thos. Harding, .. | 100 | 0 | 0 |
| April 29, | Sir John Shore, 2nd Subscript, | 1,000 | 0 | 0 |
| Aug. 1, | C. Barber, ditto, .. | 200 | 0 | 0 |
| —— 13, | G. Dickinson, .... | 206 | 12 | 3 |
| Oct. 21, | William Fairlie, .. | 201 | 9 | 5 |
| Nov. 15, | Lijon Prager, .... | 200 | 0 | 0 |
| —— | Fuzel Cosaum Khawn, | 600 | 0 | 0 |
| Dec. 3, | J. R. .. .. | 200 | 0 | 0 |

## 1795.

| | | | | |
|---|---|---|---|---|
| Jan. 16, | A. Lambert, 2d Subsc. | 500 | 0 | 0 |
| —— 6, | D. Brown, .... | 100 | 0 | 0 |
| April 16, | William Ford, .. | 100 | 0 | 0 |
| Sept. 14, | Foley, .. .. | 300 | 0 | 0 |
| Nov. 12, | Pritram, .. .. | 50 | 0 | 0 |

## 1796.

| | | | | |
|---|---|---|---|---|
| Jan. 9, | Gilchrist, .. .. | 100 | 0 | 0 |
| —— 30, | Morris, .. .. | 100 | 0 | 0 |
| Aug. 4, | Gladwin, .. .. | 100 | 0 | 0 |
| Sept. 23, | J. B. Smith, . .. | 100 | 0 | 0 |
| Nov. 16, | C. Cockerell, .. .. | 100 | 0 | 0 |
| Dec. 9, | C. R. Cromelin, .. | 200 | 0 | 0 |

## 1797.

| | | | | |
|---|---|---|---|---|
| Jan. 20, | Turnbull, .. .... | 50 | 0 | 0 |
| —— | Mercer, .... ...... | 50 | 0 | 0 |
| —— | Elphinstone, ..... | 50 | 0 | 0 |
| —— | Thrupland, ....... | 50 | 0 | 0 |
| —— | Trail, .... .. | 50 | 0 | 0 |
| —— | Colebrooke, .... | 100 | 0 | 0 |
| Feb. 22, | J. P. Wade, ...... | 20 | 0 | 0 |
| Augt. 5, | Wm. Gardiner, .. | 100 | 0 | 0 |

## 1798.

| | | | | |
|---|---|---|---|---|
| April 19, | Geo. Hatch, .... | 200 | 0 | 0 |
| June, 4, | J. Vansittart, .. | 100 | 0 | 0 |
| Dec. 17, | General Alfred Clarke, ........ | 1,500 | 0 | 0 |
| —— | Col. Clifford, ...... | 100 | 0 | 0 |
| —— 17, | Mr. Cockerell, .... | 300 | 0 | 0 |
| | Carried over, Sa. Rs. .. | 57,558 | 11 | 2 |

## 1799.

| | | | | |
|---|---|---|---|---|
| | Brought over, Sa. Rs. .. | 57,558 | 11 | 2 |
| Jan. 8, | Sir R. Chambers,.. | 300 | 0 | 0 |
| —— 16, | Lieut. Col. Graham, | 300 | 0 | 0 |
| Feb. 16, | Messrs. Foreman & Co. .... ..... | 250 | 0 | 0 |
| May 14, | J. Palmer, .. ... | 100 | 0 | 0 |
| Oct. 19, | Mr. Bellie, .... | 100 | 0 | 0 |

## 1800.

| | | | | |
|---|---|---|---|---|
| Jan. 2, | Mr. Bebb, .. .. | 86 | 3 | 5 |
| June 22, | Mr. Martyne, .. | 100 | 0 | 0 |
| Sept. 2, | Mr. Egerton, .... | 300 | 0 | 0 |
| —— | Mr. Darell, ....... | 200 | 0 | 0 |
| —— 11, | Rev. P. Limrick, .. | 100 | 0 | 0 |
| —— 15, | J. P. Johnstone, .. | 100 | 0 | 0 |
| —— 18, | R. W. Cox, .. ... | 300 | 0 | 0 |
| —— 23, | Mr. S. Davis, .. | 100 | 0 | 0 |
| —— 25, | T. Mure, .. .. | 200 | 0 | 0 |
| —— | J. Bristow, .. .. | 300 | 0 | 0 |
| —— | H. S. G. Tucker,.. | 200 | 0 | 0 |
| —— | J. Haldane, .. ... | 200 | 0 | 0 |
| —— | Henry Russell, .. | 200 | 0 | 0 |
| —— | Sir J. Anstruther, | 200 | 0 | 0 |
| —— | John Boyd, .. .. | 200 | 0 | 0 |
| Oct. 3, | S. Swinton, .. .. | 50 | 0 | 0 |
| —— 28, | Richard Parry, .. | 150 | 0 | 0 |
| —— 30, | Capt. Jas. Sandys, | 200 | 0 | 0 |
| Dec. 4, | Hudson & Co. .. | 250 | 0 | 0 |

## 1802.

| | | | | |
|---|---|---|---|---|
| Jan. 18, | Archer & Co. .. | 200 | 0 | 0 |
| —— 31, | Capt. Thornhill, .. | 100 | 0 | 0 |
| Mar. 25, | W. A. Brooke, .. | 200 | 0 | 0 |
| April 13, | L. Barretto, . .. | 200 | 0 | 0 |
| —— 17, | Philpot, .. .. | 200 | 0 | 0 |
| Sept. 20, | Buller,.. .. .. | 100 | 0 | 0 |

## 1803.

| | | | | |
|---|---|---|---|---|
| Oct. 24, | Mr. Thornhill, .. | 200 | 0 | 0 |
| —— 26, | Lieut. Col. Calcraft, | 250 | 0 | 0 |
| —— | Capt. H. V. White, | 100 | 0 | 0 |
| —— 28, | Police Office, .. | 52 | 0 | 0 |
| —— | Mr. Mackenzie, .. | 100 | 0 | 0 |
| Nov. 4, | Police Office,.. .. | 32 | 0 | 0 |
| | Carried over, Sa. Rs. .. | 63,778 | 14 | 7 |

## 1803.

| | | | | |
|---|---|---|---|---|
| | Brought over, Sa. Rs. .. | 63,778 | 14 | 7 |
| Dec. 15, | S. Frazer, .. .. | 100 | 0 | 0 |
| —— 26, | Fombelle ,.. .. | 100 | 0 | 0 |
| —— | Mr. Boyd, .. .. | 150 | 0 | 0 |

## 1804.

| | | | | |
|---|---|---|---|---|
| Jan. 7, | Mr. Richardson, .. | 200 | 0 | 0 |
| —— 9, | Major Shawe, .. | 100 | 0 | 0 |
| —— 23, | Major Colebrooke, | 300 | 0 | 0 |
| —— 25, | Mr. Sherer, .. .. | 100 | 0 | 0 |
| Feb. 4, | Mr. DeRajio, .. | 50 | 0 | 0 |
| —— 7, | Mr. Lloyd, .. .. | 100 | 0 | 0 |
| —— 11, | R. Stuart, .. .. | 100 | 0 | 0 |
| —— 13, | Mr. Colebrooke, .. | 100 | 0 | 0 |
| —— 14, | Maj. Gen. Cameron, | 100 | 0 | 0 |
| —— 29, | Mr. Leslie, .. .. | 100 | 0 | 0 |
| Mar. 1, | Lieut. Col. Glass, | 50 | 0 | 0 |
| —— | Sir C. W. Blunt, .. | 50 | 0 | 0 |
| —— 12, | R. P. Smith, .... | 200 | 0 | 0 |
| April 15, | C. M. Ricketts, .. | 100 | 0 | 0 |
| —— 28, | Jas. Stewart, .. | 100 | 0 | 0 |
| —— 30, | J. N. Seally,.. .. | 100 | 0 | 0 |
| May 4, | Messrs. Gilmore & Co. .. .. | 250 | 0 | 0 |
| Oct. 20, | Mr. Home, .. .. | 100 | 0 | 0 |

## 1805.

| | | | | |
|---|---|---|---|---|
| Jan. 2, | Mr. Latteras, .. | 100 | 0 | 0 |
| —— 5, | Mr. Waddle,.. .. | 150 | 0 | 0 |
| Mar. 2, | Capt. Daniel, .. | 100 | 0 | 0 |
| June 20, | Mr. Trail, .. .. | 100 | 0 | 0 |
| —— 25, | Lord Wellesley, .. | 3,000 | 0 | 0 |
| July 8, | Mr. Myers, .. .. | 117 | 14 | 9 |
| Nov. 2, | Mr. Downie, .. .. | 24 | 0 | 0 |

## 1806.

| | | | | |
|---|---|---|---|---|
| Jan. 16, | J. S. ... .. .. | 100 | 0 | 0 |
| Mar. 24, | Mr. Fergusson, .. | 250 | 0 | 0 |
| May 3, | Thos. Dashwood,.. | 100 | 0 | 0 |
| Oct. 1, | Mr. John Hall, .. | 72 | 0 | 0 |

## 1807.

| | | | | |
|---|---|---|---|---|
| Aug. 11, | Mr. John Wall, .. | 100 | 0 | 0 |
| Nov. 9, | Major Paton, .. | 64 | 0 | 0 |
| —— | Mr. John Deabrue, | 100 | 0 | 0 |
| —— | S. A. Colvin, .. .. | 100 | 0 | 0 |
| | Carried over, Sa. Rs. .. | 70,806 | 13 | 4 |

## 1807.

| | | | | |
|---|---|---|---|---|
| | Brought over, Sa. Rs. | 70,806 | 13 | 4 |
| Nov. 9, | Mr. N. Apeah, .. | 50 | 0 | 0 |
| —— | Col. Sir W. Keirr, .. | 100 | 0 | 0 |
| —— | Hon. Col. Eden, .. | 100 | 0 | 0 |
| Dec. 1, | Mr. Vrignon, .. | 200 | 0 | 0 |

## 1808.

| | | | | |
|---|---|---|---|---|
| Jan. 2, | Jas. Alexander, .. | 250 | 0 | 0 |
| —— 8, | Gen. Hewitt, .. | 800 | 0 | 0 |
| —— 21, | Rev. P. Limrick for self and friends, | 673 | 1 | 0 |
| Feb. 6, | R. Alexander, ... | 10 | 1 | 0 |
| —— 9, | Mr. John Gilmore, | 300 | 0 | 0 |
| —— | Rev. P. Limrick for friends, .. | 78 | 8 | 0 |
| —— 12, | Mr. McNabb, .. | 100 | 0 | 0 |
| —— 13, | Mr. DeSouza, .. | 200 | 0 | 0 |
| —— 15, | Rev. P. Limrick for friends, ... | 54 | 0 | 0 |
| —— | Mr. Cunningham, | 4 | 0 | 0 |
| —— | Mr. P. Doyle, .. | 4 | 0 | 0 |
| —— 19, | Rev. P. Limrick for friends, .. | 49 | 8 | 0 |
| —— 23, | Gunganarain Baboo, | 100 | 0 | 0 |
| —— 27, | W. Dring, .. .. | 100 | 0 | 0 |
| —— | Rev. P. Limrick for friends, .. | 109 | 0 | 0 |
| Mar. 15, | Mr. John Rauling, | 1,500 | 0 | 0 |
| —— | Lord Minto, .. .. | 2,000 | 0 | 0 |
| —— 16, | Rev. P. Limrick for friends, .. | 86 | 8 | 0 |
| April 9, | Mr. Scott, .. .. | 200 | 0 | 0 |
| —— 16, | Rev. P. Limrick for friends, .. | 83 | 11 | 0 |
| June 30, | Lord Minto, .. . | 100 | 0 | 0 |
| July 16, | Mr. W. H. Harton, | 200 | 0 | 0 |
| Nov. 29, | B. Crip, .. .. | 500 | 0 | 0 |
| Dec. 6, | Goopee Mohun, .. | 500 | 0 | 0 |

## 1809.

| | | | | |
|---|---|---|---|---|
| Feb. 4, | J. D. Alexander | 200 | 0 | 0 |
| Mar. 16, | Col. J. Garstin, .. | 100 | 0 | 0 |
| June 3, | Police Office, .... | 50 | 0 | 0 |
| Dec. 28, | Mr. Gilmore, .... | 250 | 0 | 0 |
| | Carried over, Sa. Rs. .. | 79,859 | 2 | 4 |

## 1810.

| | | | | |
|---|---|---|---|---|
| | Brought over, Sa. Rs... | 79,859 | 2 | 4 |
| Jan. 15, | Mr. C. F. Martyne, .. .. | 100 | 0 | 0 |
| Feb. 19, | Mr. P. Lumsden | 20 | 0 | 0 |
| —— 19, | Mr. J. D'Cruze, | 64 | 0 | 0 |
| Aug. 9, | Messrs. Harton & Co. .. .. | 200 | 0 | 0 |
| —— 30, | Police Office, .. | 20 | 0 | 0 |
| Dec. 10, | Court of Requests, | 250 | 0 | 0 |
| —— 22, | Mr. J. Hunter. .. | 100 | 0 | 0 |
| —— 28, | J. Turnbull, .... | 160 | 0 | 0 |
| —— | E. B. Lewin, .. | 160 | 0 | 0 |
| —— | J. D. Alexander, | 250 | 0 | 0 |
| —— 29, | T. Stanely .. .. | 50 | 0 | 0 |

## 1811.

| | | | | |
|---|---|---|---|---|
| Jan. 2, | Messrs. J. & R. Kyd, .. .. | 500 | 0 | 0 |
| —— | Lieut. Col. W. Keirr, | 50 | 0 | 0 |
| —— | Lieut. Col. W. Eden, ... .. | 50 | 0 | 0 |
| —— | Major D. Lumsden, .. .. | 50 | 0 | 0 |
| —— 19, | Mr. J. N. Sinclair, .. ... | 32 | 0 | 0 |
| —— | J. D. Renne, .. .. | 32 | 0 | 0 |
| —— 23, | P. D'Cruze, .. .. | 64 | 0 | 0 |
| —— | M. & N. Lackerstein, .. ... | 32 | 0 | 0 |
| —— | John D'Cruze, .. | 50 | 0 | 0 |
| —— | Palmer & Co. .. | 500 | 0 | 0 |
| —— | Messrs. Scott Wilson & Co. | 100 | 0 | 0 |
| —— | C. M. Ricketts, .. | 100 | 0 | 0 |
| —— | Wm. Morton, .. | 100 | 0 | 0 |
| —— | Hogue, Davidson & Co. | 300 | 0 | 0 |
| —— | Sarkies Johannes, | 100 | 0 | 0 |
| —— | David Campbell, | 100 | 0 | 0 |
| —— | Dr. Jas. Hare, .. | 200 | 0 | 0 |
| —— | A. Russell, .. .. | 500 | 0 | 0 |
| —— | A. Colvin, ... .. | 100 | 0 | 0 |
| —— | Geo. Davidson, .. | 100 | 0 | 0 |
| —— | R. P. Smith, .. | 100 | 0 | 0 |
| | Carried over, Sa. Rs. .. | 84,393 | 2 | 4 |

1811.

| | | | | |
|---|---|---|---|---|
| | Brought over, Sa. Rs. | 84,393 | 2 | 4 |
| Jan. 23, | Geo. Cruttenden, | 100 | 0 | 0 |
| —— | H. Wood, .. .. | 100 | 0 | 0 |
| —— | J. Mackillop, .. | 100 | 0 | 0 |
| —— | Gen. Hewett .. | 200 | 0 | 0 |
| —— | Messrs. Tulloh & Co. .. .. .. | 160 | 0 | 0 |
| —— | James McTaggart, | 100 | 0 | 0 |
| —— | Robert Downie, .. | 200 | 0 | 0 |
| —— | Gould, Campbell and Co. .. .. | 100 | 0 | 0 |
| —— | James Taylor, .. | 100 | 0 | 0 |
| —— | Messrs. Colvin Bazette and Co. ... ... | 500 | 0 | 0 |
| —— | Dr. J. Fleming, | 200 | 0 | 0 |
| Feb. 1, | Mr. P. Speke .. | 200 | 0 | 0 |
| —— 20, | William Money, | 250 | 0 | 0 |
| —— | J. H. Fergusson, .. | 100 | 0 | 0 |
| —— 28, | C. Strettell, .. | 100 | 0 | 0 |
| —— | W. Blackstone, .. | 100 | 0 | 0 |
| Mar. 5, | Thos. Dashwood, | 100 | 0 | 0 |
| —— 8, | Mr. DeSouza, .. | 100 | 0 | 0 |
| —— | Mr. Abrue, .... | 32 | 0 | 0 |
| —— | Mr. Churchill, .. | 50 | 0 | 0 |
| —— 9, | Mr. Hunter, .. .. | 100 | 0 | 0 |
| —— | Mr. Bruer, .. .. | 100 | 0 | 0 |
| —— | R. C. Fergusson .. | 50 | 0 | 0 |
| —— 15, | J. Fombelle, .. .. | 100 | 0 | 0 |
| —— 28, | E. Mackintosh, .. | 100 | 0 | 0 |
| —— | J. Melville, .... | 100 | 0 | 0 |
| —— | C. Whalley, .... | 50 | 0 | 0 |
| —— 29, | J. P. Larkins, .. | 50 | 0 | 0 |
| —— | R. M. Thomas, .. | 50 | 0 | 0 |
| —— | W. Myers, .... | 50 | 0 | 0 |
| April 1, | R. Scott, .. .. | 100 | 0 | 0 |
| —— 10, | Major Imlack, | 50 | 0 | 0 |
| April 19, | Mr. Hollings, .. | 100 | 0 | 0 |
| —— 23, | J. Lumsden, .. | 200 | 0 | 0 |
| —— 29, | Mr. Mactier, .. | 250 | 0 | 0 |
| May, 14, | H. Russell, .... | 100 | 0 | 0 |
| —— 16, | Mr. Colebrooke, | 200 | 0 | 0 |
| —— 23, | H. T. Calcroft, .. | 50 | 0 | 0 |
| —— | Gen. R. Maccan, .. | 100 | 0 | 0 |
| June 3, | R. Uvedale, .... | 100 | 0 | 0 |
| —— | Sir J. Royd, .. | 200 | 0 | 0 |
| | Carried over, Sa. Rs. | 89,485 | 2 | 4 |

1811.

| | | | | |
|---|---|---|---|---|
| | Brought over, Sa. Rs. | 89,485 | 2 | 4 |
| June 4, | Capt. T. Sherwood, | 50 | 0 | 0 |
| —— 18, | Capt. J. Lowe, .. | 100 | 0 | 0 |
| —— 28, | Jno. Shoolbred, .. | 100 | 0 | 0 |
| July 6, | Col. J. Paton, .. | 100 | 0 | 0 |
| Aug. 2, | Col. P. Carey, .. | 50 | 0 | 0 |
| —— 16, | H. Wilson, .. .. | 50 | 0 | 0 |
| —— 21, | Lt. Col. G. Ball, .. | 100 | 0 | 0 |
| —— 22, | W. H. Harton, .. | 200 | 0 | 0 |
| —— | C. Buller, .. .. | 100 | 0 | 0 |
| Sept. 5, | G. Dowdeswell, .. | 100 | 0 | 0 |
| Oct. 1, | Police Office, .. | 50 | 0 | 0 |
| —— 12, | Mr. Bradey, .. | 40 | 0 | 0 |
| —— 21, | C. F. Martyn, .. | 50 | 0 | 0 |
| —— 31, | Jos. Johnstone, .. | 50 | 0 | 0 |
| Nov. 1, | D. Macnabb, .. | 32 | 0 | 0 |
| —— 13, | W. C. Blacquire, | 50 | 0 | 0 |
| —— 19, | J. N. Sealy, .. | 50 | 0 | 0 |
| —— 22, | Dr. J. Loyden, .. | 50 | 0 | 0 |
| —— | Capt. T. Hill, .. | 50 | 0 | 0 |
| —— | Police Office, .. | 64 | 0 | 0 |
| Dec. 13, | Dr. W. R. Munro, | 200 | 0 | 0 |

1812.

| | | | | |
|---|---|---|---|---|
| Jan. 2, | J. & R. Kyd, .. | 200 | 0 | 0 |
| —— 17, | T. Powney, .... | 200 | 0 | 0 |
| —— 22, | Capt. Johnson, .. | 100 | 0 | 0 |
| Feb. 7, | Commodore Hays, | 100 | 0 | 0 |
| —— | Col. Calcroft, .. | 14 | 0 | 0 |
| —— 22, | Capt. C. Stuart, .. | 200 | 0 | 0 |
| Mar. 30, | Rev. D. Brown, .. | 100 | 0 | 0 |
| Apr. 20, | R. Fergusson, .. | 32 | 0 | 0 |
| Nov. 11, | R. Rocke, .. .. | 500 | 0 | 0 |
| —— 20, | Police Office, .. | 100 | 0 | 0 |
| Dec. 2, | J. Burgess, .. | 100 | 0 | 0 |
| —— 7, | W. C. Rees, .... | 100 | 0 | 0 |
| —— | Police Office, .. | 90 | 0 | 0 |

1813.

| | | | | |
|---|---|---|---|---|
| Jan. 11, | Capt. C. Stuart, .. | 100 | 0 | 0 |
| —— 27, | H. St. G. Tucker, | 100 | 0 | 0 |
| ——, | M. H. Turnbull, .. | 50 | 0 | 0 |
| Feb. 20, | Johannes Sarkies, | 500 | 0 | 0 |
| —— | Messrs. Kyd and Co. .. .. | 200 | 0 | 0 |
| | Carried over, Sa. Rs. | 93,907 | 2 | 4 |

## 1813.

| | | | | |
|---|---|---|---|---|
| | Brought over, Sa. Rs. | 93,907 | 2 | 4 |
| June 25, | J. Lowe, .. .. | 8 | 0 | 0 |
| Aug. 26, | Lieut. Col. Hawkins, | 50 | 0 | 0 |
| —— | J. G. Henderson, . | 100 | 0 | 0 |
| —— | John Adam, .. | 100 | 0 | 0 |
| —— | Mr. M. Cheese, .. | 50 | 0 | 0 |
| Nov. 20, | Mr. James Pattle, | 100 | 0 | 0 |
| —— 24, | W. H. Trant, .. | 200 | 0 | 0 |
| —— 26, | Richmond Thackery, | 100 | 0 | 0 |
| Dec. 17, | Gen. Nugent, .. | 800 | 0 | 0 |
| —— 20, | Earl of Moira, ... | 3,000 | 0 | 0 |
| —— 22, | Sir E. H. East, .. | 200 | 0 | 0 |

## 1814.

| | | | | |
|---|---|---|---|---|
| Jan. 5, | J. Doyle, .. .. | 100 | 0 | 0 |
| Mar. 15. | Messrs. Kyd & Co., | 200 | 0 | 0 |

## 1815.

| | | | | |
|---|---|---|---|---|
| May 10, | Messrs. Kyd & Co., | 200 | 0 | 0 |
| June 17, | Rev. H. L. Loring, | 100 | 0 | 0 |
| Aug. 4, | Dr. Hunter, .. | 300 | 0 | 0 |
| Sep. 23, | The Right Rev. Lord Bishop, | 400 | 0 | 0 |
| Nov. 4, | Dr. W. Russell,. . | 160 | 0 | 0 |
| Dec. 5, | J. H. Fergusson, | 280 | 0 | 0 |

## 1816.

| | | | | |
|---|---|---|---|---|
| Oct. 8, | Geo. Collier, ... | 200 | 0 | 0 |
| Nov. 1, | Dr. R. Leny, .... | 160 | 0 | 0 |

## 1817.

| | | | | |
|---|---|---|---|---|
| May 14, | Rev. Thos. Robertson, | 100 | 0 | 0 |
| Nov. 27, | Henry Alexander, | 100 | 0 | 0 |

## 1818.

| | | | | |
|---|---|---|---|---|
| Oct. 16, | Lieut. Col. Lyon, | 100 | 0 | 0 |
| Dec. 10, | W. O. Salmon, .. | 200 | 0 | 0 |

## 1819.

| | | | | |
|---|---|---|---|---|
| May 24, | Mr. Fendall, ... | 100 | 0 | 0 |
| Aug. 23, | James Young, .. | 300 | 0 | 0 |
| Nov. 20, | James Colvin, .. | 100 | 0 | 0 |
| Dec. 7, | John Abbott, .. | 160 | 0 | 0 |
| | Carried over, Sa. Rs. | 1,01,875 | 2 | 4 |

## 1820.

| | | | | |
|---|---|---|---|---|
| | Bought over, Sa. Rs. | 1,01,875 | 2 | 4 |
| Feb. 19, | Hon. J Adam, .. | 500 | 0 | 0 |
| Apr. 12, | A. Mactier, .. | 200 | 0 | 0 |
| Dec. 19, | Colvin, and Co., .. | 100 | 0 | 0 |

## 1821.

| | | | | |
|---|---|---|---|---|
| Jan. 27, | Chas. Lushington, | 100 | 0 | 0 |

## 1822.

| | | | | |
|---|---|---|---|---|
| June 18, | T. Prinsep, .. .. | 160 | 0 | 0 |
| —— | Holt Mackenzie, .. | 160 | 0 | 0 |
| Dec. 14, | G. Ballard, .. .. | 200 | 0 | 0 |
| —— 17, | A. Russell, .. .. | 100 | 0 | 0 |
| —— 30, | P. Sutherland, .. | 50 | 0 | 0 |
| Dec. 30, | J. Colvin, .. .. | 100 | 0 | 0 |

## 1823.

| | | | | |
|---|---|---|---|---|
| Jan. 2, | Madub Dutt, .. | 50 | 0 | 0 |
| —— 18, | R. Holme, ... .. | 100 | 0 | 0 |
| —— | J. D. and C. D. Crounnile and J. Child, | 1,000 | 0 | 0 |
| —— 20, | C. Lushington, .. | 200 | 0 | 0 |
| Mar. 15, | Mr. Mactier, .. | 280 | 0 | 0 |
| July 19, | Hon. Elphinstone, | 200 | 0 | 0 |
| —— 31, | James Child, .. | 1,294 | 8 | 0 |

## 1824.

| | | | | |
|---|---|---|---|---|
| Jan. 5, | A. Colvin, .. .. | 150 | 0 | 0 |
| Feb. 18, | C. Lushington, .. | 100 | 0 | 0 |
| —— | H. Wood, ... .. | 100 | 0 | 0 |

## 1825.

| | | | | |
|---|---|---|---|---|
| Feb. 22, | Messrs. Fergusson and Co. | 200 | 0 | 0 |

## 1826.

| | | | | |
|---|---|---|---|---|
| Jan. 3, | Lord Bishop, .. | 100 | 0 | 0 |
| —— 18, | Raja Buddinauth Roy, | 30,000 | 0 | 0 |
| —— 26, | Dr. Gibb, ... .. | 100 | 0 | 0 |
| Feb. 2, | A. Colvin's Friend, | 32 | 0 | 0 |
| —— 17, | Reoploll Mullick, | 100 | 0 | 0 |
| | Carried over, Sa. Rs. | 1,37,551 | 10 | 4 |

## 1826.

| | | | Sa. Rs. | As. | P. |
|---|---|---|---|---|---|
| | Brought over, Sa. Rs. | | 1,37,551 | 10 | 4 |
| April | 20, | Raja Nursingchunder Roy & Sibchunder Roy, | 20,000 | 0 | 0 |
| May | 26, | A. Horseburgh, .. | 16 | 0 | 0 |
| —— | | Dwarkanath Tagore, | 100 | 0 | 0 |
| —— | 31, | Messrs. Mackenzie & Co. | 60 | 0 | 0 |
| June | 13, | W. Wright, .. | 100 | 0 | 0 |
| —— | 20, | John Fendall, .. | 100 | 0 | 0 |
| —— | 24, | J. Anderson, .. | 283 | 7 | 0 |

## 1828.

| | | | | | |
|---|---|---|---|---|---|
| Oct. | 24, | Messrs. Breen & Co. | 65 | 4 | 0 |
| | Carried over, Sa. Rs. | | 1,58,277 | 5 | 4 |

## 1831.

| | | | | | |
|---|---|---|---|---|---|
| | Brought over, Sa. Rs. | | 1,58,277 | 5 | 4 |
| July | 29, | Collier and Bird, | 100 | 0 | 0 |

## 1832.

| | | | | | |
|---|---|---|---|---|---|
| Mar. | 22, | Aushootosh Day, | 50 | 0 | 0 |
| —— | | Radhakissen Mitter, | 50 | 0 | 0 |
| —— | | Promothnath Day, | 50 | 0 | 0 |

## 1833.

| | | | | | |
|---|---|---|---|---|---|
| April | 20, | Lieut. Col. Beatson, | 50 | 0 | 0 |

## 1837.

| | | | | | |
|---|---|---|---|---|---|
| Dec. | 18, | Alexander Colvin, | 93 | 12 | 0 |
| | Total, Sa. Rs. .. | | 1,58,670 | 1 | 4 |

Q. 3. Of the funds so acquired by Will or Donation, what parts now remain vested for behoof of the Hospital? And how vested and secured? And what parts have been lost and expended? And when, and for what, purposes expended? And by whose authority?

*A.* The whole of the funds of the Native Hospital on the 24th August, 1838, amounting to Co's. Rs. 2,95,413 : 5 : 4, are invested in Government 5 and 4 per cent. Securities, and are placed in the hands of the Government Agent. The only loss the Institution has sustained, has been by the failure of the Treasurers, is Sa. Rs. 15,146, out of which a dividend has been received of Co's. Rs. 499 : 9 : 4.

Q. 4. Abstract? An Abstract of the Income and Expenditure of the Native Hospital.

*A.* An Abstract Statement of Receipts and Disbursements of the Native Hospital from the 1st of September, 1836, to the 31st August, 1837.

| | *Co's. Rs.* | *As.* | *P.* | | *Co's. Rs.* | *As.* | *P.* |
|---|---|---|---|---|---|---|---|
| 1837 August 31st, To Hospital charges, .. .... | 13,780 | 2 | 2 | 1837 August 31st, By Govt. donation, at 1,045 Co's. Rs. per month, .... .... | 12,540 | 0 | 0 |
| To Mr. Surgeon Martin's salary, at Sa. Rs. 175 per month, ... ... | 2,240 | 0 | 0 | Interest on Government Securities, .... .... | 15,376 | 5 | 8 |
| ,, Secretary's Do. with 1 peon at 155 ℔ month, .. | 1,984 | 0 | 0 | The late Mr. J. Barretto's half-yearly legacy, at Sa. Rs. 1,725 : 4 : 1, .... | 3,680 | 9 | 2 |
| ,, Mr. W. Leach, Pensioner, .. .. .. .. | 786 | 0 | 0 | Annual Subscriptions, .. | 416 | 0 | 0 |
| ,, Excess disbursements. on account of the Dispensaries, ... .... | 324 | 7 | 2 | The late Messrs. Alexander & Co's. first dividend, .. | 499 | 9 | 4 |
| Balance, .... .... | 16,268 | 11 | 3 | Amount left by patients died in the Native Hospital, .. | 44 | 14 | 9 |
| | | | | The late Mr. F. Mendes' bequest, Sa. Rs. 2000, or Co's. Rs. 2,133 : 5 : 4 less legacy duty to the crown and charges for drawing a release in duplicate, .. | 1,825 | 13 | 8 |
| Co's. Rs..... | 34,383 | 4 | 7 | Co's. Rs..... | 34,383 | 4 | 7 |

*Q.* 5. Abstract proceedings of the Governors of the Hospital, relative to the inconvenience of the present site, from the nearness of some of the surrounding premises, and to the purchase thereof; and of the evidence obtained as to the practicability and expense of purchasing the adjoining ground.

*A.* Resolution 2d. passed at the Annual General Meeting of Subscribers on the 7th December, 1837.

Secretary submitted Mr. Surgeon Martin's Letter and Plan, proposing the purchase of the ground adjoining the Hospital premises.

To W. DACOSTA, ESQ.
*Secretary to the Native Hospital.*

SIR,

I believe it was determined at the Annual Meeting of last year that propositions of any importance should be submitted to the Governors before the day of Meeting, that they might thus be the better prepared to decide on their merits.

I beg therefore to represent to the Governors, that the number of In-patients has more than doubled in the six years that I have served in the Native Hospital; and there can be no doubt that ere long it will be necessary to enlarge the Institution, so as to meet the rapidly increasing demands upon it.

An inspection of the accompanying Plan of the Hospital and adjoining premises will shew, that to effect any thing useful in this way, it will be necessary to purchase the long godown No. 9, the front lower roomed building, No. 6, and the Bazar ground next to it, No. 7; No. 8 also, to the north-east, cuts in closely upon the Hospital, and would be a very desirable purchase; but the others, viz. 6, 7, and 9, stand so much in the way of ventilation that their purchase becomes a matter of absolute necessity, in event of the contemplated additions being made to the Hospital.—The godown, No. 9, is within three feet of the Surgeon's house, and stands along the south-east end of the Hospital. I am induced to bring the subject now before the Governors, as our funds are in a flourishing condition, and as I understand that household property is cheap at present.

I have the honor to be, Sir,
Your obedient servant,
*(Signed)* J. R. MARTIN.

NATIVE HOSPITAL,
*November* 17*th*, 1837.

Resolved,—That it is adviseable to make preliminary inquiries as to the titles and terms upon which the pieces of ground marked 6, 7, 8, and 9, can be had—Baboo Ramcomul Sen consented to make these inquiries.

To W. DACOSTA, ESQ.
*Secretary to the Native Hospital.*

DEAR SIR,

In compliance with the request of the Meeting of the Governors of the Native Hospital, I have made the necessary inquiry, the several pieces of lands about the Hospital proposed to be added to it. The unwillingness of the parties to whom the lands belong,

to part with them, and the references made by one another of the several members, and the dilatoriness in giving final answers of their determination, prevented my submitting the result of my inquiry earlier ; but I now beg to state, for the information of the Governors,

There are altogether eight lots of property, of which four are in dispute in the Court, and in want of proper authority cannot be sold or let. One offered to let on a permanent lease ;—one willing to sell on reasonable terms.

No. 6. A lowered roomed house and shop on eight cottahs of ground, belonging to one Cossinauth Paulit, a writer in the Board of Revenue Office, let for forty Rupees per month. He would not part with it unless a good price is given. His Letter marked A, which accompanies, will shew his terms, which I consider the most exorbitant ;—he may let the property on a permanent lease.

No. 7. There are four lots of lands in this number :—

i. Is the Musjeed, on two cottahs of land, and shops.

ii. Tenanted huts on eight cottahs, belonging to the estate of Meersydoo.

iii. Ditto, ditto, to Hurloll Mittro.

iv. House and ground belonging to the estate of the late Mr. Gregory, a painter. As this is the most important number, I shall detail the circumstances connected with it.

1st. The Musjeed was established by Choonee Dhye, a Mussulman female, who died many years ago. She endowed it with property and land under a Towlah Namah. After her death, a Moollah managed it—the Moollah having died, the property fell in the hands of Meersydoo, a Thannadar of Calcutta, who is now dead, and whose family are in the possession of it. The ground about the Musjeed is let for three Rupees a month. The party are willing to dispose of it, but the Mahomedan law does not I should think allow it. I have some doubts about the title deeds, &c.

2d. Land, eight cottahs, let for eight Rupees a month, which I understand belonged to Choonee Dhye also, and is a part of the endowment. But Sydoo's sons state that they have regular bills of sale of the property ;—they are willing to sell or let it to the Hospital on a reasonable valuation.

3d. Twenty cottahs, belonging to Baboo Hurloll Mittro, let for twenty Rupees a month. He would not sell the property, but will give it on a permanent lease if required. His note marked B, accompanies this.

4th. Is a part of the late Mr. Gregory, Minature Painter's property. He died intestate—he has children, but one of age. Mr. Jacobs manages the estate. It cannot be sold without authority of the Court, but we may be able to get it as soon as there is an executor appointed.

No. 8. Consists of two lots :—

i. Is an old house, and 5½ cottahs of ground belonging to Mr. Gomis, a writer in the Publick Department; it was let before at twenty Rupees per month, but for want of repairs it has been deserted. It is left to a family in which there are some minors, and can neither be sold nor divided now. The party has no means to keep it in order. Mr. Gomis in his note to me marked C, shews the difficulty of selling it. We cannot get it immediately, but may obtain it hereafter, as none would like to purchase land contiguous to an Hospital, and Mr. Gomis can get no tenant to hire it.

ii. Eleven cottahs of land let for fourteen Rupees per month, belonging to the estate of the late Moonshee Ameeroddeen—he had no issue. Moonshee Hossain Allie was his executor, who also died heirless. The estates of both are in litigation, and I believe the matter is in the Court. It cannot be sold without the consent of the widows of the deceased Ameeroddeen and Hossain Allie, who have left an immense fortune. The families are not in want.

No. 9. Is a spacious long godown, double row, with an upper-roomed house on the border of the Roads, belonging to the Chundnee Bazar, the property of the late Gocool Mittro's family. It is about 435 feet long, and forms a considerable part of the Bazar. The property has been bequeathed to several members of the Mittro's family, and is now in the hands of the receiver, Mr. Macnaghten. The proprietors are unwilling to part with it for any sum, because by giving it up, would injure, if not destroy the Bazar. Hurloll Mittro's note to me is here annexed **D.** I had a conference with Mr. Macnaghten on the subject; he tells me that he has no authority to make any negociation about selling the property, but if the party to whom it belongs give their consent, he would refer the matter to the Court. But to obtain their consent is impossible, and the purchase is at present out of the question.

I am, Dear Sir,
Your faithful servant,
*(Signed)* RAMCOMUL SEN.

*April 14th*, 1838.

*Native Hospital 16th April*, 1838.

The Secretary having received the Report of Baboo Ramcomul Sen on the subject of the ground proposed to be purchased at the last annual Meeting of Subscribers, submits the same for the information of the Governors. The plan and proceedings of the Meeting are submitted for reference, if required.

*(Signed)* W. DACOSTA,
*Secretary.*

The plan is *not* sent with the Papers, but the difficulties appear so great that I think we had better abandon for the present the notion of purchasing these parcel of lands.

*(Signed)* E. RYAN,
G. UDNY,
A. COLVIN,
D. TAGORE,
J. PRINSEP,
J. COLQUHOUN,
J. P. GRANT,
S. NICOLSON,
H. M. PARKER,
W. W. BIRD,
T. SMITH,
C. H. CAMERON,
J. YOUNG,
RAMCOMUL SEN.

I rather think that another and better site altogether could be procured for the Hospital, for less money than the present premises would sell for.

*(Signed)* A. COLVIN.

Q. 6. A plan of the Hospital and premises attached.
*A.* Sent herewith.

W. DACOSTA,
*Secretary.*

CALCUTTA, NATIVE HOSPITAL,
*August 25th*, 1838.

# No. 32.

*Additional Queries.*

*Query* 1st. The principal *sum* bequeathed by Mr. John Barretto is not stated, nor in what Government loan invested, nor are the terms of the bequest.

It would seem that the half-yearly statement required of the expenditure, that it is in some way specially appropriated by the testator.

*Answer.* The only official information received on the subject of the late Mr. John Barretto's legacy, is contained in Mr. E. B. Lewin, Master in Equity's letter to the Secretary, a copy of which is marked **A**, and submitted. But by private communication with the late Mr. Joseph Barretto, the late Secretary was informed that a sum of nearly 500,000 Sicca Rupees was bequeathed by the late Mr. John Barretto, the interest of which was to be distributed, for charitable purposes, under the direction of Mr. Joseph Barretto and the other Executors; but as the word 'Trustee' was by mistake omitted in the late Mr. John Barretto's Will, the Judges of the Supreme Court passed a decree, that the principal sum should be paid into the hands of the Master; but as it was evident from the tenor of the Will of the deceased, that it was his intention that his Executors should have the sole disposal of the interest for such charitable purposes as they might deem proper, Sir Edward H. East directed the Master to communicate with Mr. Joseph Barretto, the acting Executor, and to distribute it in such a manner as he might suggest; accordingly the interest, (after paying the Master's commission) amounting to Sicca Rupees 26,200 per annum, was assigned as follows:—

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 Pensioners, at 20 Rupees each per month, Sa. Rs. | 2,400 | 0 | 0 | | | |
| 5 Relations of the deceased, at ditto, .. .. .. .. | 1,200 | 0 | 0 | | | |
| | | | | 3,600 | 0 | 0 |
| Calcutta Jail, .. .. .. .. .. .. .. .. .. .. .. .. .. | | | | 1,000 | 0 | 0 |
| Native Hospital, .. .. .. .. .. .. .. .. .. .. .. | | | | 3,600 | 0 | 0 |
| Principal Roman Catholic Church, .. .. .. .. .. .. .. | | | | 3,600 | 0 | 0 |
| Protestant Church, .. .. .. .. .. .. .. .. .. | 5,760 | 0 | 0 | | | |
| Education of poor children, .. .. .. .. .. .. | 1,440 | 0 | 0 | | | |
| | | | | 7,200 | 0 | 0 |
| Goa Charity, .. .. .. .. .. .. .. .. .. .. .. .. .. | | | | 3,600 | 0 | 0 |
| Bombay ditto, and School, .. .. .. .. .. .. .. .. | | | | 1,800 | 0 | 0 |
| Poor at Bombay, .. .. .. .. .. .. .. .. .. .. .. .. | | | | 1,800 | 0 | 0 |
| Sa. Rs. | | | | 26,200 | 0 | 0 |

All particulars regarding the above legacy, may be obtained from the Master's office, who paid the same from the 20th June, 1814, to 20th June, 1826, and the Accountant General of the Supreme Court paid it from the 9th February, 1827, to the 12th April, 1838, half-yearly. No particulars of the legacy have been communicated to the Secretary to the Native Hospital, by either the Master in Equity or the Accountant General of the Supreme Court.

The following is the form of a Receipt granted by the Treasurers to the Master in Equity, on their receiving the legacy; and from the failure of Messrs. Alexander and Co., Treasurers, the Secretary, who has conducted the duties of Sub-Treasurer, has granted a similar one. The statement half-yearly, submitted before the legacy is received, is made out from the Disbursements of the Native Hospital; the last legacy received being the credit. A copy of the letter which accompanies the above statement, is also submitted, marked **B.** This is the mode that has been adopted from the first receipt of legacy,—it must have been introduced by the Treasurers, Messrs. Alexander and Co., as no order or direction on the subject is to be found in the books of the Native Hospital.

## A.

To GEORGE DACOSTA, ESQ.

*Secretary to the Native Hospital.*

SIR,

May I request to be furnished with a statement, or view of the establishment of the Native Hospital, and of its existing funds. I trouble you with this application, to aid my judgment in framing a charitable distribution, under a decree of the Supreme Court, by which I suppose it probable that your Institution may be benefited.

If you should be pleased to comply with my application, it is desirable that there may be the least practicable delay.

I have the honour to be, &c.

*(Signed)* EDWARD B. LEWIN.

MASTER'S OFFICE, COURT HOUSE,
*22nd December,* 1813.

To E. B. LEWIN, ESQ.

*&c. &c.,*

*Fort William.*

SIR,

I have the honour to acknowledge the receipt of your letter of the 22nd instant, which was immediately submitted to the Governors of the Native Hospital, by whom I am directed to transmit to you a copy of the Rules framed for the management of that Institution, also a comparative Register of Patients, from the 1st September, 1794, to the 31st August, 1813, and a copy of the statement of Receipts and Disbursements laid before the last General Meeting, shewing the balance and state of the funds on the 1st September last. The funds of the Hospital consist, partly of an allowance from Government of one thousand Rupees per month, in support of the Institution, and partly of donations from individuals. You will be pleased to observe from the comparative Register of Patients admitted since the Hospital was established, that during the first year only 216 patients were admitted, and that the number has been gradually increasing to the year 1812-13, when it actually amounted to 12,882, and as there is no restriction to the admission of patients, there is every probability of the number increasing annually.

I have, &c.,

*(Signed)* GEORGE DACOSTA,
*Secretary.*

CALCUTTA,
*24th December,* 1813.

## B.

To A. DOBBS, ESQ.

*Accountant General, Supreme Court, Calcutta.*

SIR,

I have the honour to inclose for your information an account of the Native Hospital, from which you will perceive in what manner the sum of Sa. Rs. 1,725 : 4 : 4, or Co's. Rs. 1,840 : 4 : 7, received from you on the 14th December, 1837, has been appropriated.

I have the honour to be, &c.

*(Signed)* W. DACOSTA,
*Secretary.*

*Dr. Accountant General, Supreme Court, in account current with the Native Hospital. Cr.*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1837. | | | | | 1837. | | | |
| Dec. 15, | To Hospital charges for November, 1837, | 693 | 7 | 0 | Dec. 14, | By amount received from Mr. T. Dickens, Accountant General, Supreme Court, on account of the late Mr. John Barretto's half-yearly legacy, Sa. Rs. 1,725:4:4, or Co's. Rs. | 1,840 | 4 | 7 |
| | Mr. Surgeon Martin's salary for Do. | 186 | 10 | 8 | | | | | |
| 1838. | Secretary's Do. with 1 Peon, .. .. | 165 | 5 | 4 | | | | | |
| Jan. 19 ,, | In part of the Hospital charges for Dec. 1837, .. .. | 794 | 13 | 7 | | | | | |
| | Co's. Rs. | 1,840 | 4 | 7 | | Co's. Rs. | 1,840 | 4 | 7 |

CALCUTTA NATIVE HOSPITAL,
*12th April*, 1838.
*For the Bank of Bengal Treasurers.*

*(Signed)* W. DACOSTA, *Secretary.*

*Q.* General Lewis Thomas' Legacy.

There are no particulars given of this legacy, neither its amount—the date when it became payable—whether it is an annuity of 100 Sa. Rs. per annum merely, or this is the interest of a principal sum bequeathed—from whom the sum of 1,300 Rs. has been received—who is answerable for the payment of the sum bequeathed—nor in what security it is invested.

*A.* No particulars have been communicated to the Secretary on the subject of the late General Lewis Thomas' legacy, beyond what is contained in the correspondence submitted. The late Mr. John Palmer, Executor to the estate of the late General Lewis Thomas, paid 100 Rs., and Messrs. Allan, Paton and Co., Attornies for Colonel Sir Robert Cunliffe, Bart., surviving Executor, paid 1,200 Rs. The surviving Executor to the estate of the late General Lewis Thomas is answerable for the annual payment of this legacy. How the assets of the estate are invested, the Secretary has not been informed.

To W. DACOSTA, ESQ.
*Secretary, Native Hospital.*

DEAR SIR,

Will you have the goodness to refer to the books of the Native Hospital, and inform us up to what period you have received the annual sum of Sa. Rs. 100, bequeathed by the late General Lewis Thomas in 1825, to the Native Hospital. The payment used to be made by Messrs. Palmer and Co., or the late Mr. John Palmer, the Executor of the late General Thomas.

We are, Dear Sir,
*(Signed)* ALLAN, PATON & Co.

CALCUTTA,
*23d April*, 1838.

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To MESSRS. ALLAN, PATON & Co.

DEAR SIRS,

General Lewis Thomas during his life-time, on the 3d February, 1823, sent to the Native Hospital 100 Sa. Rs. as a donation, and after his demise, on the 24th May, 1826, the late Mr. John Palmer sent another 100 Rs. This is the whole of the sum the Hospital has received on account of the General.

I am, &c.
*(Signed)* W. DACOSTA.

*24th April*, 1838.

## To THE MANAGERS OF THE NATIVE HOSPITAL.

GENTLEMEN,

Having recently taken charge of the affairs of the estate of the late General Lewis Thomas, as attornies for Sir Robert Cunliffe, Bart., we find upon looking into the accounts, that the deceased's bequest (as explained in the annexed extract from the Will) to the Native Hospital, does not appear to have been attended to, nor, as your Secretary Mr. W. Dacosta informs us, even communicated to you.

General Lewis Thomas died about the month of May, 1824, and the Executors in this country were Mr. John Palmer and Sir Robert Cunliffe, Bart. The former, until his own decease, in 1835, had the entire management of the funds; and we therefore need scarcely add, that great part of the same, in this country, were lost by the failure of Messrs. Palmer and Co., to the extent of about Sa. Rs. 80,000. Dividends have now been recovered from the estate of Messrs. Palmer and Co. Our object in now addressing you is, that you will be pleased to take the matter into consideration, and state, under the circumstances above explained, what sum you would be pleased to accept in full of the said bequest, it being very desirable that the affairs of the estate should be brought to an early termination.

We have the honour to be, &c.

*(Signed)* ALLAN, PATON & Co.

*Extract from Codicil, dated Cuttack, 30th November*, 1818.

"With similar emanations of love and gratitude to my good God, and a lively sense of the "comforts afforded me in this magnificent quarter of the globe, by its patient, simple, "and docile Natives, during a long period of years from the days of my boyhood, I Will "and direct that the sum of One Hundred Calcutta Sicca Rupees per annum, in perpetuity, "(Calcutta Sa. Rs. 100 per annum), be paid in trust to the Managers of the Hospital for "the Native sick in Calcutta."

CALCUTTA,
*26th July*, 1838.

True Extract,
*(Signed)* ALLAN, PATON & Co.

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*Copy of a Letter from* JOHN PALMER, *Esq., Executor to the estate of the late General Lewis* THOMAS,*—Calcutta, 23d May*, 1826.

To W. DACOSTA, ESQ.
*Secretary, Native Hospital.*

DEAR SIR,

As Executor to the late General Lewis Thomas, I have the pleasure to inform you, that officer bequeathed to the Native Hospital the sum of Sicca Rupees one hundred per annum, and I shall have much pleasure in paying the first year's annuity, from the 1*st May*, 1825 to the 1st instant, on your favouring me with a receipt for the sum.

I am, &c.

*(Signed)* J. PALMER.

NATIVE HOSPITAL,
*24th May*, 1826.

Received from John Palmer, Esq., Executor to the late General Lewis Thomas, the sum of Sicca Rupees One Hundred, being the General's legacy to the Native Hospital, for the year 1825-26.

*(Signed)* W. DACOSTA,
*Secretary.*

Sa. Rs. 100 : 0 : 0

To MESSRS. ALLAN, PATON & Co.,

*Attornies for Sir Robert* CUNLIFFE, *Bart., surviving Executor to the estate of the late General Lewis* THOMAS, *deceased.*

GENTLEMEN,

Having submitted your letter, dated the 26th ultimo, to the Governors of the Native Hospital, I am directed to forward to you a receipt for the arrears of legacy now due, and to request you will further pay over the sum of two thousand five hundred Sicca Rupees, in Government 4 per cent. security, to meet the legacy as it becomes due hereafter.

CALCUTTA, NATIVE HOSPITAL, I have the honour to be, &c.
*3d August* 1838. *(Signed)* W. DACOSTA,
*Secretary.*

To W. DACOSTA, ESQ.

*Secretary, Native Hospital.*

DEAR SIR,

We beg to acknowledge the receipt of your letter of the 3d instant, and in reply to state, that we are not prepared to hand over so large a sum as Sa. Rs. 2,500 to meet the annual gift to the Native Hospital, without a reference to the Executor in England; but if the Governours will be pleased to accept a note for Sa. Rs. 2,000 in cash, we shall take upon ourselves to adjust it so.

CALCUTTA, We are, &c.
*6th August,* 1838. *(Signed)* ALLAN, PATON & Co.

To MESSRS. ALLAN, PATON & Co.,

*Attornies for Sir Robert* CUNLIFFE, *Bart, surviving Executor to the estate of the late General Lewis* THOMAS, *deceased.*

DEAR SIRS,

Your last letter, dated the 6th instant, having been submitted to the Governors, I am instructed to inform you, that the Governors have but one course to pursue as Trustees for a Publick Institution,—there are apparently assets to meet their whole claim, and they cannot enter into any compromise, but expect the whole to be paid; this has been done as to the arrears, and the surviving Trustees, under this rule, need pay in future 100 Sa. Rs. per annum, or the Governors may accept a sum which will produce 100 Sa. Rs. when invested in Government securities.

CALCUTTA, NATIVE HOSPITAL, I am, &c.
*16th August,* 1838. *(Signed)* W. DACOSTA,
*Secretary.*

THE LATE DR. JOHN FLEMING'S LEGACY.

*London, 24th June,* 1829.

GENTLEMEN,

Under the Will of my late friend, Doctor John Fleming, dated the 24th October, 1828, a bequest has been made to the Institution of which you are the Managers, namely,

the Native Hospital, of a fund deposited in the hands of his agents, Messrs. Alexander and Co., for the purpose of providing for certain annuities or pensions to some of his old Native servants on his retiring from India. For your further information I subjoin an extract from the Will.

" I bequeath the sum that I deposited with the house of Alexander and Co., in Cal- " cutta, (for the purpose of paying small pensions to some of my old Native servants) to " the Managers of the Native Hospital, on condition of their continuing to pay the " pensions;"—from which you will observe, that my friend being still desirous of insuring the continuance of the annuities in question, has accompanied the above bequest to the Managers of the Native Hospital with a condition, that the periodical payments should be made (as heretofore the same have been paid by Messrs. Alexander and Co.) during the respective lives of the pensioners. The precise amount in the hands of Messrs. Alexander and Co. I am unable to state, further than the balance appearing on the last account received from them, dated 30th April, 1828, was Sa. Rs. 8,670 : 7 : 0.

I have this day written to Messrs. Alexander and Co., with my authority to them, as the Executor of Dr. J. Fleming, to pay over to you the balance of the fund in question, on their being satisfied, either by the purchase of funds to meet the respective annuities or otherwise, that the periodical payments to the pensioners are duly secured, and that the Will of my late friend is thus complied with.

*To the Managers of the Native Hospital,* I am, &c.
*Calcutta.* *(Signed)* THOS. WILKINSON.

Ordered—That the Secretary address Mr. Thomas Wilkinson on the subject of these documents; and that Messrs. Alexander and Co. be requested to prepare for the signature of the Governors, such an indemnification as they may deem necessary.

To THOMAS WILKINSON, ESQ.

*Executor to the estate of the late Doctor John Fleming, deceased.*

SIR,

I am directed by the Managers of the Native Hospital to acknowledge the due receipt of yours in triplicate, under date the 24th June last. The Managers have communicated with Messrs. Alexander and Co. on the subject of the late Doctor John Fleming's legacy. Messrs. Alexander and Co., the Treasurers to the Native Hospital, do not feel authorized to transfer finally to the funds of the Native Hospital the balance of the account enclosed by you, but as a temporary measure will do it, on being indemnified by the Managers.

Before a final transfer can be made, you will have the kindness to send out an exemplification of the Will of the late Dr. Fleming, duly authenticated, together with a power for some individual in India to act for you. It will be necessary to obtain from the Supreme Court of Calcutta a probate of the Will, on the authority of which Messrs. Alexander and Co. will be justified in making the required transfer. The condition of the bequest shall be duly attended to; the surviving pensioners of the late Dr. John Fleming shall not be neglected.

I am, &c.
CALCUTTA NATIVE, HOSPITAL, *(Signed)* W. DACOSTA.
*1st December,* 1829. *Secretary.*

To MESSRS. ALEXANDER & Co.

GENTLEMEN,

With reference to the letter addressed to us by Mr. Thomas Wilkinson, as Executor of the late Dr. John Fleming, under date the 24th June last, and to your note of the 8th instant, relative to the transfer of the funds in your hands belonging to the estate of the late Dr. John Fleming, and bequeathed by him to the Native Hospital, we hereby engage to hold you harmless for paying over the amount without the authority of a local administrator to the estate, after the usual period of three months. We further engage on this being done, to pay to the surviving pensioners, two in number, the usual pension they have heretofore received.

2 Pensioners— Bundoo Hurkara, paid in Calcutta, at 7 Rs. per month. Chunta Bearer, at Cuttack, at 3 Rs. per month.

We are, &c.

(*Signed*) J. M. CALCUTTA,
W. B. BAYLEY,
C. T. METCALFE,
JOHN TURNER,
C. R. BARWELL,
H. SHAKESPEAR,
H. MACKENZIE,
A. OGILVY,
J. YOUNG,
G. J. GORDON.

To W. DACOSTA, ESQ.,
*Secretary to the Native Hospital, Calcutta.*

SIR,

I have to acknowledge the receipt of your letter of the 1st December last, informing me of the result of the communication from the Managers of the Native Hospital to Messrs. Alexander and Co., regarding the payment of certain funds bequeathed to the former, by my late friend Doctor John Fleming.

The letter which, as the Executor of Dr. Fleming, I addressed to Messrs. Alexander and Co., last year, would I thought have been sufficient for effecting the object of the testator, without either of the documents, which it appears Messrs. Alexander and Co. now require the production of, before payment of the funds in question; and my solicitors, Messrs. Tennant, Harrison, Tennant, are of opinion that under the circumstances of this bequest, the instructions formerly sent by me might with propriety have been acted upon.

To prevent however further delay in this arrangement, I have, in conjunction with my Co-Executor Mr. Dent, forwarded to Messrs. Mackintosh and Co., a power of attorney, accompanied with the exemplification of the Will of the late Doctor Fleming, authorizing them to receive from Messrs. Alexander and Co. whatever monies may be due to the estate, and to discharge the legacy to the Managers of the Native Hospital. I trust therefore no other obstacle will occur in complying with the wish of my deceased friend.

I am, &c.

LONDON, (*Signed*) THOMAS WILKINSON.
*28th May*, 1830.

To WILLOUGHBY DACOSTA, ESQ.

*Secretary to the Native Hospital, Calcutta.*

SIR,

We have the honour to acknowledge the receipt of the letter from the Governors of the Native Hospital of Calcutta, of the 14th instant, engaging to hold us harmless on our paying over to the funds of the Hospital, in the Bank of Hindostan, the legacy bequeathed to that Institution by the late Dr. John Fleming, without the authority of a local administrator to the estate; and we now beg leave to hand you a statement of the late Dr. John Fleming's account with us, made up by anticipation to the 1st July next, when the balance appearing in its favour, Sa. Rs. 9,825, forming that bequest, will be paid over accordingly to the credit of the account of the Hospital, in the Bank of Hindostan.

The future payment of the pensions to the surviving pensioners of the deceased, will be paid from the funds of the Native Hospital.

CALCUTTA, We are, &c.
*9th April,* 1830. *(Signed)* ALEXANDER & Co.

## THE LATE MR. JOHN ATHANASS' LEGACY.

*Estate—John Athanass.*

*To the Treasurers of the Native Hospital.*

GENTLEMEN,

I have to address you relative to a legacy of Sa. Rs. 1,000, bequeathed to the Native Hospital in Dhurrumtollah by the Will of the late Mr. John Athanass. I should have communicated with you sooner on the subject, but delayed doing so in the hopes of being able to dispose of the landed property of the testator, upon the sale of which the payment of all the legacies bequeathed by him depends.

The Will is dated the 18th September, 1833, and several gentlemen were appointed Executors, all of whom having declined to act, I alone took out probate.

The terms of the bequest to the Institution are as follow—" I give and bequeath " unto the Treasurers, for the time being, of the Native Hospital in Dhurrumtollah, in " Calcutta aforesaid, the sum of Sicca Rupees One Thousand, to be applied towards the " support of that laudable Institution."

The testator devised his real estate to his Executors, who are also appointed trustees, in trust to sell the whole by publick auction or private sale, at certain fixed prices, and directed the proceeds of the sale to be invested in Government Securities or Bank Shares, and after disposing of four-fifths in trust for his children, he bequeathed the remaining fifth in trust for the payment of the legacies enumerated. These legacies in the whole amount to Sa. Rs. 35,000.

The testator in a Schedule annexed to his Will, fixes a certain price upon each parcel of his landed property, making an aggregate account Sa. Rs. 2,54,000, which in the month of September, 1833, would appear to have been a very high estimate, and much more than it is presumed it can ever realize.

He died in the month of September last year, and in November following, I deputed Mr. Moore, of the firm of Moore, Hickey and Co., and Mr. Gray the builder, to inspect and report upon this, and then state the market value of the whole. This estimate gives the total value of Sa. Rs. 1,16,400.

The property was duly advertised, and put up to sale by publick auction in the month of December last, but there was not a single bidder for any one lot, nor has any offer been since made.

The Will directs, that if the first failed, another sale should be tried by publick auction, after the lapse of one, two, or three years, at reduced prices.

The personal property did not amount to more than about 15,000 Rupees.

The Will provides, that in case the remaining fifth of the proceeds of sale shall not yield 35,000 Rupees, then all the legacies, except one of Sa. Rs. 10,000, shall abate in proportion, and be paid rateably.

I believe I have put you in possession of all the circumstances connected with the payment of the legacies that you could desire to know; but the Will and accounts of the estate are open to your inspection at any time; and on reference to my office you will learn what progress is made from time to time in effecting sales of the property.

The family of the testator, as well as the legatees generally, are interested in the Executor availing himself of every favourable opportunity that may offer for disposing of it.

I am, &c.

*(Signed)* W. H. SMOULT,

*Registrar Supreme Court, and Executor of John Athanass, deceased.*

REGISTRAR'S OFFICE, CALCUTTA,
*June 29th*, 1836.

Resolution passed at the Annual General Meeting of Subscribers of the 1st December, 1836.

Resolved—That the thanks of the Governors be presented to Mr. Smoult, and he be requested to afford further information from time to time.

## THE LATE MR. FRANCIS MENDES' LEGACY.

*Treasurers of the Native Hospital—Sa. Rs.* 2,000.

MY DEAR DACOSTA,

Who is the Treasurer of the Hospital? I will have to pay the above sum from Mendes' estate, being a legacy left. Shall I order the release to be prepared, or how?

Yours truly,

To WILLOUGHBY DACOSTA, ESQ. *(Signed)* L. D'SOUZA.
*June 18th*, 1837.

MY DEAR D'SOUZA,

Do so, I will receive the amount for the Hospital.

Yours truly,

To L. D'SOUZA, ESQ. *(Signed)* W. DACOSTA.
*June 18th*, 1837.

MY DEAR DACOSTA,

I have ordered the release in duplicate. 2,000 Sa. Rs. is left by poor Mendes, out of which they have deducted 200 Sa. Rs. as legacy duty to the Crown, so I will pay you 1,800 Sa. Rs. on the 1st of August.

Yours truly,

*June 19th*, 1837. *(Signed)* L. D'SOUZA.

To LAWRENCE D'SOUZA, AND JONATHAN DUNCAN DOW, ESQRS.
*Executors to the estate of the late Francis* MENDES, *Esq., deceased.*

GENTLEMEN,

As Managers and controlling Directors of the Native Hospital of this Presidency, we hereby authorize and impower you to pay to Willoughby Dacosta, Esq. Sub-Treasurer of the Institution, the sum of Sicca Rupees Two Thousand, bequeathed by your Testator, in his last Will and Testament, for the use, benefit, and purpose, of the said Institution; receiving from him the usual release, which will to all intents and purposes be a good and sufficient discharge, as well to the Executors, as the personal estate and effects of the deceased. We are, &c.

*(Signed)* H. M. PARKER.
JAS. PRINSEP.

CALCUTTA, NATIVE HOSPITAL,
*4th August*, 1838.

*Q.* The dates of the Donations are not mentioned, nor the amount summed up, the *years* would be sufficient for the dates, but the summation is necessary.

*A.* The dates have been added to the Donation list, and the amount total summed, as will appear by a reference to the Donation list.

Q. 2d. The third query is not so distinctly answered, as to enable the Committee to report upon the state of these funds, in the manner desired by the Governour General, as Governour of Bengal.

There are two sets of Funds inquired after—

1st. Acquired by *Will*.

These appear to be under Mr. Barretto's Will, Dr. Fleming's, Mr. Mendes', General Thomas', Mr. Athanass', (not yet recovered).

The query is, whether all or what parts of *each of these Legacies* is vested and secured, and how; and whether any part of *them* has been lost or expended.

2d. Acquired by *Donation*.

The same query as to Donations, would be answered by stating whether they have been regularly vested in Government securities as received, or kept till a certain time in the hands of the Treasurers, and then invested; and whether any, and if any, what part, of the capital received has been expended on repairs, or otherwise; and the general correctness would appear by the total sums bequeathed and received from the Executors, and total Donations, and Interest, if any, beyond annual expenditure. All put together, being equal to the capital now remaining vested, minus losses, &c.

It is probable this cannot be done with perfect accuracy for the whole period, without considerable labour; but if the Books have been kept with accuracy, such a view can be easily given as to shew how the funds have been managed.

The query embraces two inquiries as to the disposal of the funds so obtained—

1st. The Losses.—2d. The Expenditure.

The first is answered by stating the only loss; but it is not stated whether the retaining so large a sum in the Treasurers' hands, was authorized or prohibited by the Rules of the Institution, or by order of the Governors.

The second is not answered.—The object is to know whether any part of the principal of the Donations has at any time been expended on repairs or additions to buildings, &c. or to meet an excess of an ennual expenditure beyond income.

*A.* The Secretary is unable to afford the desired information on the above query, as the sums received on account of Legacies as well as Donations were never kept distinct, but carried as received into the general fund of the Native Hospital. The principal sums could be picked out of the accounts, but the interest arising on them has been mixed up with the interest, donations, annual subscriptions, &c. &c., and carried in that shape into the account as a fresh credit; and from this circumstance cannot at this distant period be separately stated.

The Treasurers to the Institution, Messrs. Alexander and Co., collected all sums, and invested them in Government securities. The Secretary receives the Government securities at the close of the year, for the purpose of submitting the same to the Annual General Meeting of Subscribers, which being over, the securities are again returned to the Treasurers.

The Hospital has but one general fund and one account of disbursements, into which the cost of repairs, establishment, country medicines, and every charge, is introduced. The expenditure and receipt for the past year is submitted to the Annual General Meeting of Subscribers, and by them passed. The accounts are next sent up to Government, so that the funds of the Hospital are invested in Government securities, and placed in the hands of the Government Agent. Since the failure of Messrs. Alexander and Co. the Secretary has conducted the duties of Sub-Treasurer, collected all sums, and sent the same into the Bank of Bengal; and when the balance amounted to 8,000 Rs., 5,000 was invested in Government securities, and 3,000 remain in the Bank to meet any contingent charges that might be incurred.

The Rules of the Institution do not touch on the precise sum that is to remain uninvested in the hands of the Treasurers. They appear to have possessed a discretionary power, on which they acted without the interference of the Governors.

The annual expenditure of the Native Hospital has never exceeded its annual receipts.

*Q.* 3. The Abstract states a balance in hand on the 31st August, 1837, of Rupees 16,268 : 11 : 3; but it does not state in whose hands the balance is—whether any, and how much of it is invested on security of Government paper—or at what rate of interest, and to what amount of paper, and when invested.

It is observed, that the *Abstract* is not so framed as to exhibit the comparative amount of *income* and *expenditure*, though it affords the means of ascertaining it; the debit side being composed of *income*, being the amount of the four first items and of casual receipts, which ought to be added to capital, being the last three. But if this is, as is presumed, the usual mode of stating the account laid before the Governors of the Native Hospital, it is all the Fever Hospital and Municipal Committee can require.

The desire of the Governour General, intimated to the Fever Hospital and Municipal Committee, in reference to the report they shall make to him, is, that they shall "enter "into an examination and review of the funds already appropriated to charities of a "Medical description—of the manner in which they are applied—of the modes which may "be suggested for their increase, or improved application—and of the relative value of these "existing Institutions."

It will be seen that the additional particulars requested above, are necessary to enable them to report as required upon the funds of the Native Hospital, and their application.

*A.* The abstract statement submitted, was merely to shew the receipts and disbursements of the past year, 1836-37; but the balance stated in favour of the Institution, amounting to Co's. Rs. 16,268 : 11 : 3, was invested in two Government 4 per cent. securities,

viz. on the 31st December, 1836, Rs. 5,000, and on the 11th July, 1837, Rs. 8,206 : 3 : 6, as stated in the account current passed at the Annual General Meeting of Subscribers of the 1st December, 1837. The balance, Co's. Rs. 3,062 : 7 : 9, remained in the Bank of Bengal —Treasurers.

NOTE.—The Chairman will also be obliged to the Secretary to send him a copy of the Rules and Regulations of the Native Hospital, for the use of the Committee.

*A.* Two copies of the original, and the same number of revised Rules and Orders relative to the Native Hospital are sent herewith, agreeably to the wishes of the Chairman.

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## GENERAL ABSTRACT.

*State of the Funds of the Native Hospital on the 31st August, 1838.*

| | | | | |
|---|---|---|---|---|
| 8 Government 5 per cent. Securities, | .. .... | 2,11,400 | 0 | 0 |
| 8 Ditto, .... 4 per cent. Ditto, | .. .. .... | 46,800 | 0 | 0 |
| | Sa. Rs. .. | 2,58,200 | 0 | 0 |
| | or Co's. Rs. .. | 2,75,413 | 5 | 4 |
| 4 Ditto, .... 4 per cent. Ditto, | .. .. .... | 20,000 | 0 | 0 |
| The above 20 Govt. Securities are placed in the hands of the Govt. Agent, | | 2,95,413 | 5 | 4 |
| Cash with the Bank of Bengal—Treasurers, | .... .... | 2,007 | 12 | 11 |
| | Co's. Rs. .... | 2,97,421 | 2 | 3 |

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*In the above is included all Legacies received, viz.*

| | | | | |
|---|---|---|---|---|
| Annual Legacies. | The late Mr. John Barretto's Legacy from 20th July, 1814, to the 12th April, 1838, .. .. Sa. Rs. | 86,573 | 2 | 11 |
| | The late General Lewis Thomas' Do. from 1825-26 to 1837-38 being 13 years, at 100 Sa. Rs. per annum, .. .. .. | 1,300 | 0 | 0 |
| | The late Dr. John Fleming's Ditto, .. .. .. .. | 9,825 | 0 | 0 |
| | The late Mr. Francis Mendes' Do. Sa. Rs. 2,000, less legacy duty to the Crown, and charges for drawing releases in duplicate, .. .. .. .. .. | 1,711 | 11 | 10 |
| | Sa. Rs. | 99,409 | 14 | 9 |

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*Landed Property and Buildings.*

| | | | | |
|---|---|---|---|---|
| In 1797. | The present Hospital premises and ground purchased for .. Sa. Rs. | 22,000 | 0 | 0 |
| 1825. | Adjoining 26¾ cottahs of ground, purchased and inclosed, .. .. | 10,948 | 8 | 0 |
| | New Buildings for the reception of Patients, Steward or Apothecary's apartments, Out-offices, &c. &c. .... | 27,541 | 7 | 7 |
| | Sa. Rs. | 60,489 | 15 | 7 |
| | or Co's. Rs. | 64,522 | 10 | 5 |

*Repairs to the Native Hospital Premises, Surgeon's Quarters, Out-Offices, &c. &c.*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1799, | March | 31, | To Repairs, .. .. .. Sa. Rs. | 373 | 3 | 3 |
| 1804, | Oct. | 6, | — Advance to Mr. W. Gordon for repairs of the Native Hospital, .. .. .. .. .. .. | 575 | 0 | 0 |
| 1805, | Feb. | 2, | — Mr. W. Gordon for ditto in full, .. .. .. .. | 725 | 0 | 0 |
| 1807, | Jan. | 9, | — Repairing Servants' House, .. .. .. .. | 126 | 8 | 0 |
| —— | Oct. | 29, | — Do. Native Hospital, in part, .. .. .. .. | 326 | 0 | 0 |
| 1808, | Dec. | 20, | — Do. Balance, .. .. .. .. .. | 324 | 6 | 0 |
| 1812, | Aug. | 19, | — A pair of sash windows, .. .. .. .. | 60 | 0 | 0 |
| —— | Dec. | 15, | — Repairing Native Hospital, in part, .. .. .. | 617 | 0 | 0 |
| 1813, | Feb. | 22, | — In further part for ditto, .. .. .. .. | 308 | 8 | 0 |
| —— | July | 14, | — Balance for ditto, .. .. .. .. .. | 308 | 8 | 0 |
| 1816, | Dec. | 18, | — Repairing Surgeon's quarters partially, .. .. | 445 | 13 | 0 |
| 1818, | July | 10, | — Mr. Jennings in part, for thorough repairing ditto, .. | 1,711 | 0 | 0 |
| —— | Dec. | 12, | — Balance for ditto, .. .. .. .. .. | 1,774 | 11 | 0 |
| 1819, | March | 19, | — Mr. Jennings for repairing Native Hospital, &c. .. | 300 | 0 | 0 |
| —— | Aug. | 10, | — Ditto in full for ditto, .. .. .. .. .. | 348 | 0 | 0 |
| 1822, | April | 24, | — Dykes and Co. for whitewashing Surgeon's quarters, .. | 350 | 0 | 0 |
| 1823, | Nov. | 21, | — Gardner and Co. for repairing Surgeon's quarters, .. | 2,593 | 14 | 3 |
| 1825, | May | 17, | — Andrew and Co. for ditto Native Hospital, .. .. | 2,483 | 2 | 1 |
| 1827, | April | 19, | — Burn and Co. repairing Surgeon's quarters, .. .. | 1,926 | 3 | 0 |
| | | | — Mr. Blechynden for constructing a drain, .. .. | 45 | 0 | 0 |
| | Aug. | 19, | — Andrew and Co. for Godown flooring, .. .. | 231 | 0 | 0 |
| 1829, | May | 27, | — Burn and Co. for repairing Native Hospital, .. .. | 4,179 | 0 | 9 |
| 1830, | May | 6, | — Ditto ditto Surgeon's quarters, .. .. .. | 2,792 | 7 | 3 |
| 1833, | April | 20, | — Andrew and Co. ditto Native Hospital, .. .. | 3,143 | 0 | 0 |
| 1836, | Feb. | 5, | — Mr. J. M. Vos ditto ditto in part, .. .. .. | 1,991 | 6 | 3 |
| | | | Sa. Rs. | 27,959 | 10 | 10 |
| | | | or Co's. Rs. | 29,823 | 10 | 5 |
| | June | 1, | — Ditto, Ditto in full, .. .. .. .. .. | 2,192 | 6 | 10 |
| | Oct. | 18, | — Burn, & Co. for repairing Surgeon's quarters in part, .. | 1,407 | 8 | 0 |
| | Dec. | 13, | — Ditto, ditto, ditto, balance, .. .. .. .. | 2,417 | 6 | 2 |
| | | | Co's. Rs. | 35,980 | 15 | 5 |

*Leper Establishment.*

| | | | |
|---|---|---|---|
| To Disbursements met on account of the Leper Establishment, from the funds of the Native Hospital, from the 1st of March, 1832, to the 31st August, 1835, being three years, 6 months, .. .. .. .. .. Sa. Rs. | 21,310 | 5 | 8½ |
| 1835, May 1st. Deduct, received from the Central Committee District Charitable Society, .. .. .... | 1,997 | 14 | 7 |
| Sa. Rs. | 19,312 | 7 | 1 |

*Dispensaries.*

State of the funds of the dependent Dispensaries raised by private subscriptions, &c. &c., Sa. Rs. 10,000, now invested in three 5 per cent. Government securities, and placed in the hands of the Government Agent. The interest arising on the capital fund of the Dispensaries, together with Government monthly Donations, not being at all times sufficient to meet the disbursements, the difference is drawn out of the funds of the Native Hospital, viz.

| | | | |
|---|---|---|---|
| On the 31st August, 1835,* | 3,739 | 13 | 9¼ |
| On ditto,.......... 1836, | 293 | 7 | 8 |
| On ditto,.......... 1837, | 324 | 7 | 2 |
| Co's. Rs. | 4,357 | 12 | 7¼ |

CALCUTTA, NATIVE HOSPITAL,
*3d September,* 1838.

W. DACOSTA,
*Secretary.*

* This sum includes annual payments made on account of the Dispensaries, from 1825-26 to 1831-35.

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## No. 33.

*Native Hospital Establishment for July,* 1838.

| | | | | | | |
|---|---|---|---|---|---|---|
| Mr. Surgeon Martin, | Co's. Rs. 186 | 10 | 8 | | | |
| Mr. P. O'Brien, first Assistant, | 266 | 10 | 8 | | | |
| Mr. G. Nalor, second ditto, | 40 | 0 | 0 | | | |
| Buxoo, Head Dresser, | 17 | 1 | 0 | | | |
| Writer, Rajkisson Mookerjee, | 10 | 10 | 8 | | | |
| Kadur, Dresser, | 17 | 1 | 0 | | | |
| Kaumer Ally, ditto, | 8 | 8 | 0 | | | |
| Oscar, Compounder, | 4 | 4 | 3 | | | |
| 2 Peons—Tacoor Doss, and Rampersaud, | 10 | 10 | 8 | | | |
| 1 Frash, | 6 | 6 | 4 | | | |
| 2 Durwans, | 8 | 8 | 6 | | | |
| 1 Dhobee, 1 Barber, | 8 | 8 | 6 | | | |
| 2 Cooks—Sudden and Hossain, | 8 | 8 | 6 | | | |
| 3 Bhistees—Kadur, Kabill, and Kiffite, | 12 | 12 | 9 | | | |
| 4 Sweepers—Mungloo, Jummun, Kongally, and Muddun, | 17 | 1 | 0 | | | |
| 1 Vaccinator,—Gobindo, | 7 | 7 | 5 | | | |
| Shaik Kabill, Bhistee, pensioner, | 2 | 2 | 1 | | | |
| | | | | 633 | 0 | 0 |

*(Signed)* P. O'BRIEN.
J. R. MARTIN.

*Secretary's Establishment.*

| | | | | | | |
|---|---|---|---|---|---|---|
| Mr. W. Dacosta, Secretary, .. .. .. .. .. | 166 | 0 | 0 | | | |
| Dhonkistno Dhur, Sirkar, .. .. .. .. .. | 8 | 8 | 6 | | | |
| Nawajwollah, Peon, .. .. .. .. .. .. | 5 | 5 | 4 | | | |
| | | | | 173 | 13 | 10 |
| Mr. W. Leach, pensioner, badly afflicted with leprosy, doing duty in the Leper Establishment as Apothecary | | | | 64 | 0 | 0 |
| Co's. Rs. | | | | 870 | 13 | 10 |

---

*Park Street Dispensary Establishment for July,* 1838.

| | | | | | | |
|---|---|---|---|---|---|---|
| Mr. Charles Reed, Apothecary, with Palkee allowance, .. .. | 238 | 14 | 11 | | | |
| Two Compounders, and two Dressers, .. .. .. .. | 36 | 4 | 3 | | | |
| 1 Durwan, 1 Peon, 1 Bhistee, 1 Sweeper, 1 Barber, .. .. | 20 | 6 | 4 | | | |
| | | | | 295 | 9 | 6 |

*(Signed)* P. O'BRIEN.
CHARLES REED, *Apothecary.*
D. STEWART, *Surgeon.*

---

*Gurranhattah Dispensary Establishment for July,* 1838.

| | | | | | | |
|---|---|---|---|---|---|---|
| Mr. John Ryper, Apothecary, with Palkee allowance, .. .. | 238 | 14 | 11 | | | |
| Essub and Ramdun, Dressers, .. .. .. .. .. | 29 | 13 | 9 | | | |
| Peroo and Bhenoo, Compounders, .. .. .. .. .. | 10 | 10 | 8 | | | |
| 1 Durwan, 1 Peon, 1 Bhistee, 1 Sweeper, and 1 Barber, .. | 20 | 6 | 4 | | | |
| | | | | 299 | 13 | 8 |
| Total Co's. Rs. | | | | 595 | 7 | 2 |

*(Signed)* P. O'BRIEN.
JOHN RYPER, *Apothecary.*
RICHARD O'SHAUGHNESSY, *Superintendent.*

Dr. D. Stewart and Mr. Surgeon Richard O'Shaughnessy, Superintendents of the two Dispensaries, draw their travelling expenses from the General Treasury direct, each 100 Co's. Rs. per month.

W. DACOSTA,
*Secretary.*

CALCUTTA, NATIVE HOSPITAL,
*September 5th,* 1838.

## No. 34.

*Queries to which Answers are requested by the Fever Hospital and Municipal Committee from*

S. NICOLSON AND J. R. MARTIN, ESQUIRES,

*Members of the Committee, dated 25th August*, 1838.

Q. 1. Is the ground where the Police Hospital now stands, in your opinion sufficiently extensive, airy, and dry, to form a good site for a General Hospital, calculated to receive 250 patients, in the first instance, and to admit of subsequent enlargement, as occasion shall require ; and would it be necessary, if a General Hospital were erected on it, to take down the Police Hospital ?

*A.* The ground now occupied by the Police Hospital is not, in our opinion, sufficiently airy and extensive; neither is the locality such as we should choose for a Native General Hospital, considering the River bank by far the most eligible site.

Q. 2. It is understood that the Medical College is placed in the same inclosure; would the buildings of the College interfere with the General Hospital if there be one erected ?

*A.* To secure the paramount object to an Hospital—free ventilation, the ground around it, and especially that towards the prevailing monsoons, should be unencumbered with walls or buildings. We think therefore, that the buildings of the Medical College would interfere with the free draft of ventilation of an Hospital situated on the site of the present Police one.

Q. 3. You are requested to frame a description of the building which, in your opinion, would be necessary and suitable for a General Hospital, for the reception, treatment, and cure of Medical cases among the Native poor of Calcutta; reference being had to the religions, customs, and ancient prejudices, which require different religions and castes to repose, and to feed, in separate apartments or dwellings.

The classification of the patients in *different wards* must therefore depend upon the double consideration of the religion or *caste*, and the *disease*.

*A.* We consider that buildings suitably disposed, and so as to form three sides of a square, would answer well. They should not form one mass, but be open and unconnected at the angles, so as to admit of ventilation.

The classification of Native patients would have to be regulated much more by the nature of their diseases, than by considerations of caste. On this latter subject, Mr. Martin has already detailed the results of his experience at the Native Hospital.

The question whether these wards may be *in the same building*, depends upon a separation so entire being required; and if any, in what case, by the rules of religion or caste?

**The arrangements necessary for health would be much more difficult of accomplishment, because very expensive to be done well, than such as have reference to caste or creed.**

It is stated in the Report (p. 109, VIII.) that the patients received into the Hospital, would consist of four classes, 1. Hindoos of low caste, 2. Hindoos of higher caste, 3. Mussulmans, 4. Christians, Jews, and others, not Hindoos or Mussulmans.

There should be no walls to a ward but the outer ones, and these ought to be protected from the direct rays of the sun by spacious verandahs.

It will be for you to consider, whether this is a sufficient practical division, with reference to the religious feelings and customary prejudices of the people; or whether a further subdivison of the Hindoos is necessary.

We think it a sufficiently practical division.

It should seem that for each necessary division of religion and caste, as many separate wards will be required, as you are of opinion will be required with reference to the classification of disease. You will therefore be pleased to state your opinion, (1.) Whether a separation of apartments, divided by walls, on the same floor, or by stories in the same building, would be a sufficiently ample compliance with the religion and prejudices of the Hindoos and the Mussulmans; or whether, and for what description of persons, a separate, and whether, if separate, a detached, building would be requisite; or, if not requisite, advisable?

*A.* On the same floor, a half wall would be sufficient division between wards; but a more complete separation of patients would of course be by separate floors.

(2.) Whether a division into four classes, as mentioned above, would be sufficient with reference to religion and caste, or whether any, and what, further division would be advisable.

*A.* Quite sufficient, we think.

(3.) What number of distinct wards would be required for each division of religion and caste in reference to the due classification of diseases?

*A.* Such an Hospital as we contemplate will enable Medical Officers to divide it, both in reference to caste and to disease; also to arrange an apartment for obstetrick purposes, if required

(4.) Whether one yard for convalescents, or patients suffering under intermittent disorders, to take the air in, would be sufficient with reference to caste, and to the nature of the diseases; and whether the flat roof may be considered sufficient for this purpose; and if more than one inclosure is advisable, how many, and of what dimensions?

*A.* Sufficient ground for exercise is indispensable to an Hospital, and no separation of it on account of caste need be made in the case contemplated.

(5.) It being considered as resulting from the evidence before the Committee, that the apartments, in which the sick are placed, should be raised a considerable height above the ground, what height ought the first floor to be from the ground? whether the under part of the building ought to be left open for a free circulation of air, under the first tier of wards, or may be closed in whole, or in part, for godowns &c.?

*A.* For mere security, an elevation of four feet may be sufficient; but, in a country such as this, subject to annual inundation, we think the higher the arch on which the lower floor is constructed the better. In point of economy, it might be well to have so much elevation as should admit of the archways being used as store rooms, &c., to which there would be no objection, provided the said store rooms were divided off by strong wooden railings only; for, any thing in the shape of separation-wall would be objectionable, as obstructing ventilation.

(6.) What ought to be the height of the several apartments—what the size and number of windows—whether furnished with jilmils only, or with glass also—and whether they ought to be opposite each other, with a thorough draft, as in a *single* house—or on one side only, the house being constructed as a double house, if this shall be more economical—and what the greatest and least distance at which the windows should be apart—reference being had to the free circulation of air, and the disposal of the beds with the greatest economy of space, consistent with the necessary airiness of the apartments?

*A.* The wards cannot be too lofty; indeed their height can only be limited by the cost. Windows should also be lofty, and extend down to the floors, but they should not be so numerous as commonly made here, to the prejudice of health by exposing the sick to a thorough draught, or something more than wholesome ventilation. The windows should have venetianed blinds, and be glazed. Space, both within and without an Hospital, is a paramount object, and nothing can compensate for the want of it.

(7.) Whether, if more economical, the building may be carried without inconvenience more than three stories high, viz. the ground floor left open, arched or not, as shall be cheapest, with reference to cost and durability, the first and second floors containing the several wards, and may consist of the ground floor so left open, and three stories of wards over it.

*A.* Two stories, raised on arches, we consider the most eligible plan for an Hospital.

(8.) The size, length, and breadth of each ward required, with reference to a total number of 250 beds, and to the probable proportions of different castes labouring under each different form of disease.

*A.* This question will, we learn, be answered by Captain Fitzgerald.

(9.) Whether verandahs would be necessary; or sun-blinds to the windows would be sufficient for coolness, considering that the inmates will be all, or nearly so, natives of Bengal.

*A.* We consider verandahs on both faces necessary; sun-blinds are not a sufficient protection.

(10.) What will be the number and descriptions of attendants required, and the apartments necessary for their accommodation, including European Apothecaries and Assistants?

*A.* This will be replied to in Question 13.

(11.) Whether a Tank will be necessary, and of what dimensions?

*A.* Two Tanks will be requisite—one for Hindoos, and the other for Mahomedans.

(12) What number of cooking-rooms, and of godowns for stores, medicines, &c. &c. and generally of what size?

*A.* We understand this query will be replied to by Captain Fitzgerald.

To these, which are the general heads occurring to the Committee, you are requested to add such further matters as you think necessary, to direct the architect in making a plan and estimate of a suitable building for the purpose proposed. In particular, you will be pleased to state your opinion in regard to the most desirable aspects, and those which ought to be particularly avoided, for the patients' wards.

Q. 4. You are requested to state separately the numbers and descriptions of all attendants, and whether European or not, as well Apothecaries, Medical assistants, nurses, &c as cooks, mehters, &c. &c., with your opinion as to the wages monthly which ought to be given to each, the expense monthly of provisions—including wine, sago, and other things medically necessary—and such country medicines as are not distributed from the Company's Dispensary; but exclusive of medicines usually furnished by the Company;—so

*A.* The following is a rough estimate, but we believe near the truth.

*Estimate of the monthly expenses of an Hospital containing 300 patients, divided into 6 wards, of 50 patients each.*

| | |
|---|---|
| One Apothecary, Secretary, and Controller of Accounts, European or Country-born, per month, .. Rs. | 400 |
| 6 Clinical Clerks, European, Country-born, or Native, at from 100 Rs. to 40 Rs. per month—1 at 100, 1 at 80, 1 at 70, 1 at 64, 2 at 40. | 390 |
| 1 Writer, or Book-keeper, .. | 20 |
| Carried over,.......... | 810 |

as to furnish a complete estimate of the probable monthly expense of the Hospital, if it shall be established.

| | |
|---|---|
| Brought over, .. .. ... | 810 |
| 6 Compounders, to act also as Dressers, from 12 Rs. to 5 Rs.—1 at 12, 1 at 10, 1 at 9, 1 at 8, 1 at 6, 1 at 5, .. .. .. .. | 50 |
| 3 Shop Coolies, at 4 each .. | 12 |
| 30 Ward Coolies or Nurses (Hindoos and Mussulman) at 4 each, including 1 Sirdar at 6, .. .. | 122 |
| 8 Sweepers, at 4, including 1 Sirdar at 6, .. .. .. | 34 |
| 10 Cooks, at 4, including 1 Sirdar at 6, ... ... ... ... | 42 |
| 1 Native Butler to have charge of diet, bedding, clothing, and store room, ... .. .. .. | 8 |
| 3 Frashes for lighting Hospital, cleaning and taking care of furniture, at 4 each, ... .. .. .. | 12 |
| 8 Water Carriers, (Hindoos and Mussulman) at 4 each, ... ... | 32 |
| 3 Barbers, at 4 each, ... ... | 12 |
| 1 Peon, ... ... .. ... | 5 |
| 2 Durwans, at 4 each, ... ... | 8 |
| 3 Dhobies, at 4 each, ... ... | 12 |
| 1 Tailor, .. .. .. | 6 |
| Total Establishment, ... | 1165 |
| Country Medicines per mensem, | 150 |
| Provisions, Wine, Sago, &c. | 500 |
| Sundries, Clothing, & Bedding, &c. | 85 |
| Total Monthly Co's. Rs. | 1,900 |

*Q.* 5. You are requested to state your opinion whether a piece of ground lately purchased by Mr. Dickens on the Chowringhee Road, and which the Chairman has mentioned to Mr Martin, would form a good site for the proposed Hospital; and whether, if the Governours of the Native Hospital, being disappointed in their wish to add to the premises attached to that Hospital where it stands, should incline to remove it to more spacious premises, Mr. Dickens's ground would afford a good site for both the proposed Medical, and the present Surgical, Hospital; and whether in this case both Hospitals might conveniently, and without risk of interfering with Native prejudices or scruples, be placed in the same building?

*A.* The ground lately purchased by Mr. Dickens, including that sold at the same time behind and adjoining Mr. Dickens's lots, we consider, next to the River-bank, the most eligible situation for a Native General Hospital.

*Q.* 6. Your opinion is desired, if you shall think the Native Hospital may be removed to the new site, as to the extent of accommodation which it would be necessary to erect for the Surgical Hospital, including the residence of the Surgeon of the Establishment, in addition to that required for the proposed Medical Hospital.

*A.* We consider that there is room on Mr. Dickens's and the adjoining lots of ground, for the present Native Surgical Hospital, in addition to the proposed Medical one; and we know of no prejudice on the part of the Natives to interfere with such plan.

*Q.* 7. You are also requested to state, in case it should be determined, instead of one Hospital for the reception of 250 patients, to erect 12 small Hospitals at a distance from each other, on separate sites, each for the reception of patients of all castes, and labouring under every variety of medical disease, what, in your opinion, would be the necessary establishment, and the monthly expense of it, *in each Hospital:* one Hospital being calculated to receive 30 patients, and the remaining 11 Hospitals 20 patients each?

*A.* We have on a former occasion answered as to the increase of establishment requisite for twelve small Hospitals. We think the cost would be nearly double; the number of patients in one large Hospital and in twelve small ones being the same. Take for example, Dr. O'Shaughnessy's estimate, which does not include either European supervision, or European medicines.

One Dispensary, .. Rs. 260
12

For 12 Dispensaries } Rs. .. 3,120 per mensem.

CALCUTTA, 1*st September*, 1838.

(*Signed*) J. R. MARTIN.
S. NICOLSON.

*Postscript.*

Mr. Martin submits the following plans of an Hospital to the Chairman of the General Committee, with the view to elicit the opinions of other and more qualified persons than himself, on the questions of plan and aspect—matters of great importance in reference to climate, and the right management of large bodies of sick.

Three buildings of two stories each, erected on a large open space, and upon arches eight or ten feet high; each building to consist of a ward for 50 men on each floor, making a total of wards for 300 men. The buildings should not join at the corners, but be left wide asunder for ventilation. For Natives the Hospital should, if possible, be on the River bank, with the ground unoccupied to that face.

Where one building is preferred (and it would seem best when of moderate size) I think it should have an eastern and western aspect, with a verandah on both faces. I prefer this aspect as admitting of a reduction of temperature, and a better ventilation (without thorough draught) and as affording exercising space for convalescents morning and evening, under shade, in the rainy season or in bad weather. The now prevalent aspect, north and south, I consider injurious to the sick, on account of the thorough draughts, especially during the cold north-east monsoon.

In addition to the windows, there should be alternate apertures in the upper and lower portions of the walls, all over the building.

To render the upper floor complete it should have a double roof.

(*Signed*) J. R. MARTIN.

## No. 35.

**To THE HONBLE. SIR JOHN P. GRANT,**

*Chairman to the Fever Hospital and Municipal Improvement Committee.*
*&c. &c. &c.*

SIR,

I have the honour to return the paper of queries relative to the Leper Asylum, to which I have attached replies, as fully and correctly as I had the means of doing.

As I have only been in Medical charge of the Leper Asylum since January, 1836, and as there are no documents kept in the Asylum but such as record the number of patients, dates of their admission, deaths, and other particulars connected with their Medical treatment, (all the papers connected with the expenditure being kept in the office of the Secretary to the Central Committee District Charitable Society), I have been indebted to several gentlemen connected with the District Charitable Society and Native Hospital for the greater part of the following information. I must therefore throw myself upon the consideration of the Committee, in excuse for any mistake which may have occurred in my replies to the queries.

I do not know whether I have been right in ascribing the credit of permanently establishing the Leper Asylum to the Governors of the Native Hospital. I have heard that a plan for the formation, and proper management, of a Leper Asylum, was originally framed by Mr. Harrington, one of the Judges of the Sudder Dewanny Adawlet, and adopted by a large Publick Meeting in the Town Hall, on the 22d August, 1818. Liberal subscriptions and donations were on this occasion realized from the Christian and Native community. The funds which were then raised proving inadequate to its continued support, an application, dated 28th October, 1819, was made to Government, for an allowance of Rs. 500 per mensem, which was refused, from an impression that the Institution would tend to attract to Calcutta an influx of lepers from the Upper Provinces. On receiving this reply from Government, the different subscriptions and donations were returned.

Mr. Harrington finding that he could not obtain sufficient support to carry his original plan into execution, determined upon doing it on a smaller scale at his own private expense, and accordingly ordered a few huts to be erected at Balleah Ghaut, in the neighbourhood of Calcutta, and gave a monthly pension to the lepers, whom he there supported.

On his departure for Europe, Mr. Harrington transferred these lepers, with about Rs. 3,000, to the Select Vestry, by the members of which body, the lepers (40 in number) were, in 1831, made over to the Central Committee District Charitable Society. Whilst in charge of the Select Vestry and Central Committee District Charitable Society, there was no establishment kept up for looking after the lepers; monthly pensions were only allowed them. In March, 1832, the Central Committee District Charitable Society made over the charge to the Governors of the Native Hospital, by whom the Institution as it now exists was formed and supported till August, 1835, when they again transferred it to the Central Committee District Charitable Society, in whose hands it has continued up to this date, and by whom all the expenses are defrayed, with the exception of the Apothecary's salary of Rs. 60 per mensem, which the Governors of the Native Hospital continue to allow.

I have the honour to be, Sir,
Your obedient Servant,
**D. STEWART, M. D.**
*Surgeon.*

LEPER ASYLUM,
*6th September,* 1838.

*Queries by the Committee on the Fever Hospital and Municipal Improvements, to which answers are requested from*

DR. STEWART,

*Of the Leper Asylum.*

The Governour General in his capacity of Governour of Bengal, has intimated to the Committee his desire, that in the report they are to make upon the various subjects referred to them, they should " enter into an examination and review of the funds already " appropriated to charities of a Medical description—of the manner in which they are " applied—of the modes which may be suggested for their increase, or improved applica- " tion—and of the relative value of these existing Institutions."

In order to enable them to report as required upon the *Leper Asylum*—forming one of the most material of these Institutions—they request from Dr. Stewart, answers to the following queries.

Q. 1. When was the Leper Asylum established; and at whose expense? And what was the number of patients it was originally designed to receive? And what was the sum expended upon its erection?

*A.* In 1832, by the Governors of the Native Hospital, and from the funds of that Institution. The Leper Asylum was not originally intended to accommodate any particular number of patients. A few huts were at first erected, to which additions were made as they were required. I am given to understand that erecting huts, levelling and raising the ground to a draining height, repairing huts, &c. from March, 1832—when the Governors of the Native Hospital first took charge of the Leper Asylum, to August 1835, when they made it over to the Central Committee District Charitable Society—cost the Native Hospital Sa. Rs. 3,191 : 15 : 5; and an additional sum of Sa. Rs. 17,208 : 14 : 4 was expended within the above dates, for supporting and clothing the patients, Surgeon's allowance, Apothecary's salary, establishment's wages, ground rent, and all the other expenses.

Q. 2. Has it been since enlarged; and if so, for the reception of what number of additional patients?

*A.* After it had been destroyed by fire on the 27th April, 1837, it was rebuilt with mud walls and tiled roofs, and slightly enlarged; sufficiently so to accommodate from ten to twenty additional patients. Rebuilding the Asylum on this occasion, cost the Central Committee District Charitable Society Co's. Rs. 2,877 : 2.

Q. 3. What number of patients is it now capable of receiving? What is its present total establishment of Medical and other attendants? What are the allowances of each, and their total amount per mensem? And what, exclusive of these, is the total monthly expense of the Asylum, distinguishing diet and clothing from medicines; and by whom defrayed?

*A.* Capable of containing from 120 to 130 individuals.

*Establishment.*

| | | | | |
|---|---|---|---|---|
| 1 Surgeon, ... | ... Co's. Rs. | 100 | 0 | 0 |
| 1 Apothecary, .. | ... .. .. | 60 | 0 | 0 |
| 1 Compounder, | ... .. .. | 8 | 0 | 0 |
| 2 Dressers, at 5 each, | .. .. .. | 10 | 0 | 0 |
| 1 Sirkar, ... | ... ... ... | 10 | 0 | 0 |
| 2 Mallies, at 4 each, | .. .. .. | 8 | 0 | 0 |
| 3 Mehters, at 4 each, | .. .. ... | 12 | 0 | 0 |
| 3 Cooks, at 4 each, . | .. ... .. | 12 | 0 | 0 |
| | Carried forward Co's. Rs. | 220 | 0 | 0 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Brought forward | Co's. Rs. | 220 | 0 | 0 | | |
| 1 Durwan, | | 6 | 0 | 0 | | |
| 1 Washerman, | | 5 | 0 | 0 | | |
| 1 Shaver, | | 1 | 8 | 0 | | |
| | | | | | 232 | 8 0 |
| Diet, | | 230 | 0 | 0 | | |
| Clothing, | | 24 | 0 | 0 | | |
| Country Medicines, | | 12 | 0 | 0 | | |
| Ground rent, | | 47 | 4 | 5 | | |
| Sundries, | | 12 | 0 | 0 | | |
| | | | | | 325 | 4 5 |
| | Total, Co's. Rs. | | | | 557 | 12 5 |

defrayed by the Central Committee District Charitable Society, with the exception of the Apothecary's salary of Rs. 60 per mensem, which is paid by the Native Hospital.

*Q.* 4. Of what rank, religious description, country, and place of actual abode, are the patients received in it? Of how many wards, and what space of open ground d[oe]s it consist?

*A.* All paupers—Christians, Hindoos, and Mussulmans, residents of, but few natives of, Calcutta: some born at Goa, Amboyna, Madras, and others at Jessore, Dinapore, Patna, Benares, Lucknow, &c. There are three distinct ranges of buildings for the different sects. The Asylum consists of twelve or fourteen beegahs of ground.

*Q.* 5. A table shewing the numbers received, cured, died, discharged incurable, and remaining, in each year, for the five years ending in 1837. And the annual expense, distinguishing, (1st.) Asylum expenses, as dieting, medicines purchased, and menial attendants. (2nd.) Surgeon's and Assistants' salaries. (3d.) Repairs, and miscellaneous [cha]rges.

| Years. | Remaining in Hospital. | | | Admitted during the twelve months. | | | Died. | | | Deserted. | | | Absent. | | | Dismissed relieved. | | | Discharged for ill behaviour. | | | Remaining in Hospital. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Patients. | Relatives. | Total. | Patients. | Relatives. | Total. | Patients. | Relatives. | Total. | Patients. | Relatives. | Total. | Patients. | Relatives. | Total. | Patients. | Relatives. | Total. | Patients. | Relatives. | Total. | Patients. | Relatives. | Total. |
| 1833 | 38 | 0 | 38 | 105 | 31 | 139 | 37 | 4 | 41 | 51 | 17 | 68 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 55 | 13 | 68 |
| 1834 | 55 | 13 | 68 | 115 | 56 | 171 | 32 | 0 | 32 | 12 | 3 | 15 | 16 | 21 | 79 | 1 | 0 | 1 | 1 | 0 | 1 | 82 | 38 | 120 |
| 1835 | 82 | 38 | 120 | 56 | 15 | 71 | 22 | 2 | 24 | 0 | 0 | 0 | 31 | 21 | 55 | 5 | 1 | 6 | 2 | 3 | 5 | 75 | 26 | 101 |
| 1836 | 75 | 26 | 101 | 46 | 10 | 56 | 18 | 1 | 19 | 2 | 0 | 2 | 24 | 11 | 35 | 0 | 0 | 0 | 8 | 3 | 11 | 69 | 21 | 90 |
| 1837 | 69 | 21 | 90 | 37 | 7 | 44 | 15 | 0 | 15 | 2 | 0 | 2 | 14 | 4 | 18 | 1 | 0 | 1 | 7 | 0 | 7 | 67 | 21 | 91 |

*Annual Expenses.*

| | | | | |
|---|---|---|---|---|
| Dieting, | Co's. Rs. | 2,448 | 0 | 11 |
| Clothing, | | 338 | 4 | 0 |
| Country Medicines, | | 239 | 15 | 6 |
| Menial Attendants, | | 561 | 0 | 0 |
| Surgeons and Assistants, | | 1,536 | 0 | 0 |
| Ground Rent, | | 567 | 3 | 2 |
| Building one bungalow, and seventy-five huts, Co's. Rs. 2,877, repairs Rs. 9 : 6 | | 2,886 | 6 | 0 |
| Miscellaneous Charges, | | 224 | 14 | 1 |
| | Total, | 8,801 | 11 | 8 |

*Q.* 6. Any observation which Dr. Stewart may think it right to add, in order to complete the information desired.

*A.* In the preceding table of admissions into Hospital, deaths, &c, I have omitted two of the headings, (cures and discharged incurable) for the plain reason, that all the lepers who are admitted are looked upon as incurable; and, secondly, no cures have hitherto been made, either in my or my predecessor, Dr. Jackson's time, nor indeed am I aware that leprosy has ever been cured by purely Medical means; I have however the pleasure to subjoin the following result of the treatment adopted by me since January, 1837, when I first took Medical charge of the Asylum.

Of 79 patients who have been subjected to Medical treatment,

5 Improved in their leprous symptoms, but died from other diseases,
1 Improved, but taken away by relations,
8 Improved, but left the Asylum contrary to my wishes,
1 Improved, but discharged for repeated drunkenness,
24 Improved, and continuing to improve,
—
39
—

11 Died of different diseases, without exhibiting any improvement of leprous symptoms,
9 Continue to take medicine, without having as yet derived any benefit,
6 Left the Asylum of their own accord, without having derived any benefit,
4 Discontinued taking medicine,
—
30

the remaining ten have only within a short time commenced taking medicine.

D. STEWART, M. D.
*Surgeon.*

LEPER ASYLUM,
*6th September*, 1838.

## No. 36.

*Queries by the Committee on the Fever Hospital and Municipal Improvements, to which answers are requested from*

**S. NICOLSON, ESQ.,**
*Surgeon to the General Hospital.*

The Governour General in his capacity of Governour of Bengal, has intimated to the Committee his desire, that in the report they are to make upon the various subjects referred to them, they should "enter into an examination and review of the funds already "appropriated to charities of a Medical description—of the manner in which they are "applied—of the modes which may be suggested for their increase, or improved application—"and of the relative value of these existing Institutions."

In order to enable them to report as required upon the *General Hospital*—forming one of the most material of those Institutions—they request from Dr. Nicolson, answers to the following queries.

*Q.* 1. When was the General Hospital established, and at whose expense? And what was the number of patients it was originally designed to receive? And what was the sum expended upon its erection?

*A.* The great centre building, now denominated the General Hospital, was in its original state occupied as a garden-house by an individual, from whom it was purchased by the Government in the year 1768, and converted into an Hospital which could easily accommodate 120 patients, and if pressed for room twenty-eight more could be received without much inconvenience. I am unable to state what was the sum expended upon this building.

*Q.* 2. Has it been since enlarged; and if so, for the reception of what number of additional patients, and at what expense?

*A.* Two wings were at a subsequent period erected, each of which could accommodate 100 beds; and the whole was surrounded by a wall enclosing an area extending from east to west 880 feet, from north to south 660 feet. A house was also built in the immediate vicinity for the accommodation of the Medical Officers on duty at the Hospital. In 1807, in consequence of a change in the Medical Department of the Army, the south-east wing of the Hospital was converted into a Regimental Hospital, and placed under the direction of the Surgeon of H. Majesty's Regiment doing duty in Fort William, and it has so continued ever since.

*Q.* 3. What number of patients is it now capable of receiving? What is its present total establishment of Medical and other attendants? What are the allowances of each, and their total amount per month? And what, exclusive of these, is the total monthly expense of the Hospital, distinguishing diet and clothing from medicines, and by whom defrayed?

*A.* The centre building can now receive 120 patients, the south-west wing 92, and one-half of a small building which was erected a few years since as an Hospital for females, will accommodate 18 or 22 women. The total establishment of Medical and other attendants of the General Hospital at the present time, and the allowances of each, and their total amount per month, are as follows. [No. I.] What exclusive of these is the total monthly expense of the Hospital, I am unable to state, as all the pecuniary expenditure for diet, clothing, Bazar medicines, &c. &c. are defrayed by the Commissariat.

## No. I.

### *Establishment attached to the General Hospital.*

| | Description. | Amt. of salary to each per month in Co's. Rs. | | Description. | Amt. of salary to each per month in Co's. Rs. |
|---|---|---|---|---|---|
| 1 | Surgeon, .. .... | 600 0 0 | 1 | Head Ward Cooley, .... | 6 0 0 |
| 1 | First Asst. Surgeon and Medical Store-keeper, .... | 250 0 0 | 1 | Mate Ward Cooley, .... | 5 0 0 |
| | | | 10 | Ward Coolies, .. .... | 4 0 0 |
| 1 | Second Asst. Surgeon, .... | 150 0 0 | 1 | Head Cook, .. .... | 6 0 0 |
| 1 | Apothecary, .. .... | 150 0 0 | 4 | Cooks, .. .. .... | 5 0 0 |
| 1 | Steward, .. .... | 100 0 0 | 1 | Godown-keeper, .... | 6 0 0 |
| 5 | Apprentices, .. .... | 15 8 0 | 2 | Tailors, .. .... | 6 0 0 |
| 1 | Native Writer, .. .... | 35 0 0 | 2 | Barbers, .. .... | 6 0 0 |
| 1 | Head Compounder, .... | 10 0 0 | 1 | Nurse, .. .... | 6 0 0 |
| 1 | Assistant Compounder, .... | 8 0 0 | 1 | Female Sweeper, .... | 5 0 0 |
| 1 | Head Dresser, .. .... | 8 0 0 | 1 | Head Washerman, ... | 8 0 0 |
| 1 | Assistant Dresser, .. .... | 6 0 0 | 4 | Washermen, .. .... | 6 0 0 |
| 2 | Shop Coolies, .. .... | 5 0 0 | 1 | Mate Bearer, .. .... | 5 0 0 |
| 2 | Steward's Servants, .... | 6 0 0 | 4 | Bearers, .. .... | 4 0 0 |
| 1 | Head Bhistee, .. .... | 6 0 0 | 3 | Peons, .. .. .... | 5 0 0 |
| 4 | Bhistees, .. .... | 5 0 0 | | | |
| 1 | Head Sweeper, .. .... | 8 0 0 | | | |
| 4 | Sweepers, .. .... | 4 0 0 | | | |

N. B. The pay of the apprentices is exclusive of their rations.

Q. 4. The Hospital is understood to be primarily attached to the Garrison of Fort William; does it receive other persons not Military, and of what rank, religion, description, country, and place of actual abode?

*A.* The Hospital and Surgeons, both permanent or temporary, doing duty at the Hospital, are considered attached to Fort William, and under the orders of the Governor. It is strictly speaking a Military Establishment, it having been transferred to the Military Department in the year [illegible] when the Medical Board was instituted.

The management of the Hospital is conducted under the fixed Military regulations. The immediate charge of it is entrusted to a full Surgeon of the Establishment, and two assistant Surgeons who are permanently attached to it, and which latter reside on the spot. The ultimate control is vested in the officiating superintending Surgeon at the Presidency, and the Medical Board. Besides the sick of the European Corps in Garrison on their first arrival from Europe, who are received until their own Regimental Hospitals are prepared for them, the sick of European recruits, supernumeraries, and invalids of the Queen's and Company's Army, the Hospital is open for the reception of seamen belonging to Her Majesty's or the Company's Service, or to private and foreign ships, and also to European townsmen, and paupers—nor indeed are Europeans or Americans in any other class of life refused admittance. To those who can afford to defray their own expenses, and for sick men belonging to Her Majesty's or the Company's ships, or other vessels, a charge of one Company's Rupee per diem is made on account of each patient.

By the following table will be seen, under whose authority every description of patient can be admitted into the Hospital.

By Article the 12th, page 93, New Medical Regulations, the undermentioned Publick authorities, and others, are authorized to grant tickets for the admission of patients into the General Hospital. :—

Captains of Her Majesty's Navy.—Captains of Honourable Company's Marine.—The Master Attendant.—The Marine Surgeon.—The Garrison Staff of Fort William.—The Medical Board.—

Captains and Owners of English or Foreign trading ships—Householders of Calcutta, } These are answerable for the Hospital expenses.

Clause 1. The Magistrates of Calcutta, and Secretary to the District Charitable Society, are authorized to give free tickets of admission to paupers into Hospital.

Clause 2. The Resident Assistant Surgeons will use their discretion in admitting into the Hospital, any cases that they may think of emergency, reporting the same to the Medical Board through the usual channel.

*Q.* 5. Is it both a Medical and Surgical Hospital? And is it in any way limited in the description of cases of disease which it receives? How many wards is it divided into? And to what descriptions of disease is each ward appropriated?

*A.* It is both a Medical and Surgical Hospital, and there is no description of cases of disease that may not be admitted into it. The centre building on each floor is divided by arches into four large rooms, capable of holding forty-eight patients, and two side rooms with doors which can contain twelve beds, besides a few other small places originally left for back stair-cases or baths, which not being now required, individuals who wish to be private are occasionally allowed to occupy them. The whole of this building will therefore accommodate 148 patients.

The south-west wing of the Hospital is divided also by arches into three long wards on each floor, which can easily contain forty-four beds; and on emergency, by placing two beds against each pillar between the arches, instead of one only, 176 patients might be well accommodated in this building. There are likewise two small private rooms on each floor in this wing which could each receive two patients.

*Q.* 6. What are the descriptions of persons, and in what relative proportions, except the Military, who usually apply to it for relief?

*A.* Sailors, Government Marine Servants, Towns-people, and Paupers, are the descriptions of persons admitted into the Hospital, independent of the Military patients.

The proportions they bear to the Military are nearly as two to one. The total number of the former classes for five years, ending 31st December, 1837, being ~~6,604~~ patients, 3805 and that of the Military for the same period being

No. II.

*Abstract shewing the number of Military under Medical treatment in the General Hospital, from 1st January, 1833, to 31st December, 1837, inclusive.*

| Years. | Remained in Hospital. | Admitted. | Total. | Discharged. | Died. | Remaining. |
|---|---|---|---|---|---|---|
| Total in 1833, .. .. .. .. | 285 | 389 | 674 | 392 | 22 | 260 |
| Total in 1834, .. .. .. .. | 269 | 403 | 672 | 374 | 21 | 277 |
| Total in 1835, .. .. .. .. | 387 | 601 | 988 | 587 | 26 | 375 |
| Total in 1836, .. .. .. .. | 217 | 301 | 518 | 267 | 15 | 236 |
| Total in 1837, .. .. .. .. | 205 | 366 | 571 | 322 | 15 | 234 |
| Total for five years, .......... | 1,363 | 2,060 | 3,423 | 1,942 | 99 | 1,382 |

Q. 7. A table shewing the numbers received, and whether Medical or Surgical cases, cured, died, discharged incurable, and remaining in each year, for the five years ending 1837, and the annual expense, distinguishing, (1st) Hospital expenses, as Dieting, Medicines purchased, and menial Attendants. (2nd) Surgeon's and Assistants' salaries. (3rd) Repairs and Miscellaneous charges

*A.* First, cannot be furnished

Second from Hospital Records, No 1

Third, cannot be furnished for reasons already given, but the Medical Board, as head of the whole Medical Department, can no doubt easily furnish the Committee with the most authentick and complete information on all these points.

## No. III.

*An Abstract Statement shewing the number of Surgical, Medical, and Miscellaneous Cases under treatment at the General Hospital, from 1st January, 1833, to 31st December, 1837, inclusive.*

| Year | Surgical | | | | | | Medical | | | | | | Miscellaneous. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Remained | Admitted | Total | Discharged | Died | Remaining | Remained | Admitted | Total | Discharged | Died | Remaining | Remained | Admitted | Total | Discharged | Died | Remaining |
| Total in 1833 | 275 | 102 | [illegible] | 16 | 7 | 267 | 911 | 1,137 | 2,051 | 927 | 159 | 965 | 211 | 156 | 369 | 111 | 16 | 209 |
| Total in 1834 | 268 | 230 | 536 | 22 | 6 | 307 | 868 | 998 | 1,866 | 713 | 165 | 958 | 212 | 295 | 531 | 215 | 20 | 269 |
| Total in 1835 | 261 | 257 | 488 | 36 | 4 | 218 | 517 | 436 | 1,190 | 593 | 77 | 520 | 132 | 161 | 293 | 167 | 7 | 119 |
| Total in 1836 | 132 | 111 | 270 | 125 | 6 | 115 | 282 | 102 | 682 | 361 | 50 | 271 | 81 | 102 | 183 | 87 | 1 | 92 |
| Total in 1837 | 96 | 105 | 206 | 105 | 3 | 98 | 221 | 392 | 613 | 303 | 11 | 266 | 121 | 179 | 303 | 160 | 6 | 137 |
| Total for five years | 1060 | 870 | 1,915 | 852 | 26 | 1065 | 2,832 | 3,365 | 6,402 | 2,927 | 495 | 2,980 | 799 | 891 | 1,682 | 803 | 53 | 826 |

## No. IV.

*Abstract Statement, of the different Classes of Patients admitted into, and treated in the General Hospital from 1st January 1833, to 31st December, 1837.*

| Year | Townsmen, Clerks, Indigo People, &c. | | | | | | Seamen, H. C. Marine, H. Majesty's Navy, Harbour Masters, Steam, Semaphore and Light House Departments, &c. | | | | | | Paupers. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Remained | Admitted | Total | Discharged | Died | Remaining | Remained | Admitted | Total | Discharged | Died | Remaining | Remained | Admitted | Total | Discharged | Died | Remaining |
| Total in 1833, | 5 | 16 | 21 | 12 | 2 | 7 | 330 | 436 | 766 | 368 | 56 | 312 | 839 | 627 | 1,466 | 522 | 96 | 848 |
| Total in 1834, | 11 | 8 | 19 | 9 | 1 | 9 | 316 | 441 | 757 | 399 | 70 | 288 | 827 | 617 | 1,171 | 518 | 102 | 824 |
| Total in 1835, | 31 | 31 | 62 | 25 | 3 | 31 | 69 | 97 | 166 | 87 | 8 | 71 | 138 | 301 | 712 | 296 | 52 | 391 |
| Total in 1836, | 40 | 53 | 93 | 15 | 8 | 40 | 78 | 137 | 215 | 109 | 15 | 91 | 157 | 135 | 292 | 118 | 21 | 153 |
| Total in 1837, | 46 | 58 | 104 | 53 | 5 | 10 | 82 | 111 | 193 | 108 | 15 | 70 | 134 | 100 | 234 | 93 | 14 | 127 |
| Total for five years, | 133 | 166 | 299 | 141 | 19 | 136 | 875 | 1,222 | 2,097 | 1,071 | 161 | 862 | 2,395 | 1,813 | 4,208 | 1,577 | 285 | 2,346 |

# No. 37.

*Further* Queries to which Answers are requested by the Fever Hospital and Municipal Improvements Committee, from*

## S. NICOLSON, ESQ.,

*Surgeon to the General Hospital.*

Q. 1. The Committee have been favoured with your answers to the queries put to you regarding the General Hospital. It not having occurred to you to add any general observations under the eighth head of inquiry, the Committee will feel much obliged by your informing them whether the building now occupied as a General Hospital is in your opinion well constructed for an Hospital? Whether it has been, since your acquaintance with it, altered or improved in any respect? And what, in your opinion, are its excellencies or defects as an Hospital in the climate of Calcutta, in point of situation, aspect, airiness, and construction?

*A.* The large centre building is in my opinion well constructed, and in every respect well adapted for an Hospital; the rooms being as above described, large, lofty, and airy, and all of them furnished with glass windows in addition to the venetian blinds.

Although the plan of the western wing is not so good as that of the centre building, being less lofty, and consequently less airy, yet it makes a very good Hospital when not too much crowded.

The only additions and improvements which have been made to these Hospitals within my knowledge, were the addition of privies at each end of the centre building, verandahs to the south-west building, and glazing the windows of both Hospitals.

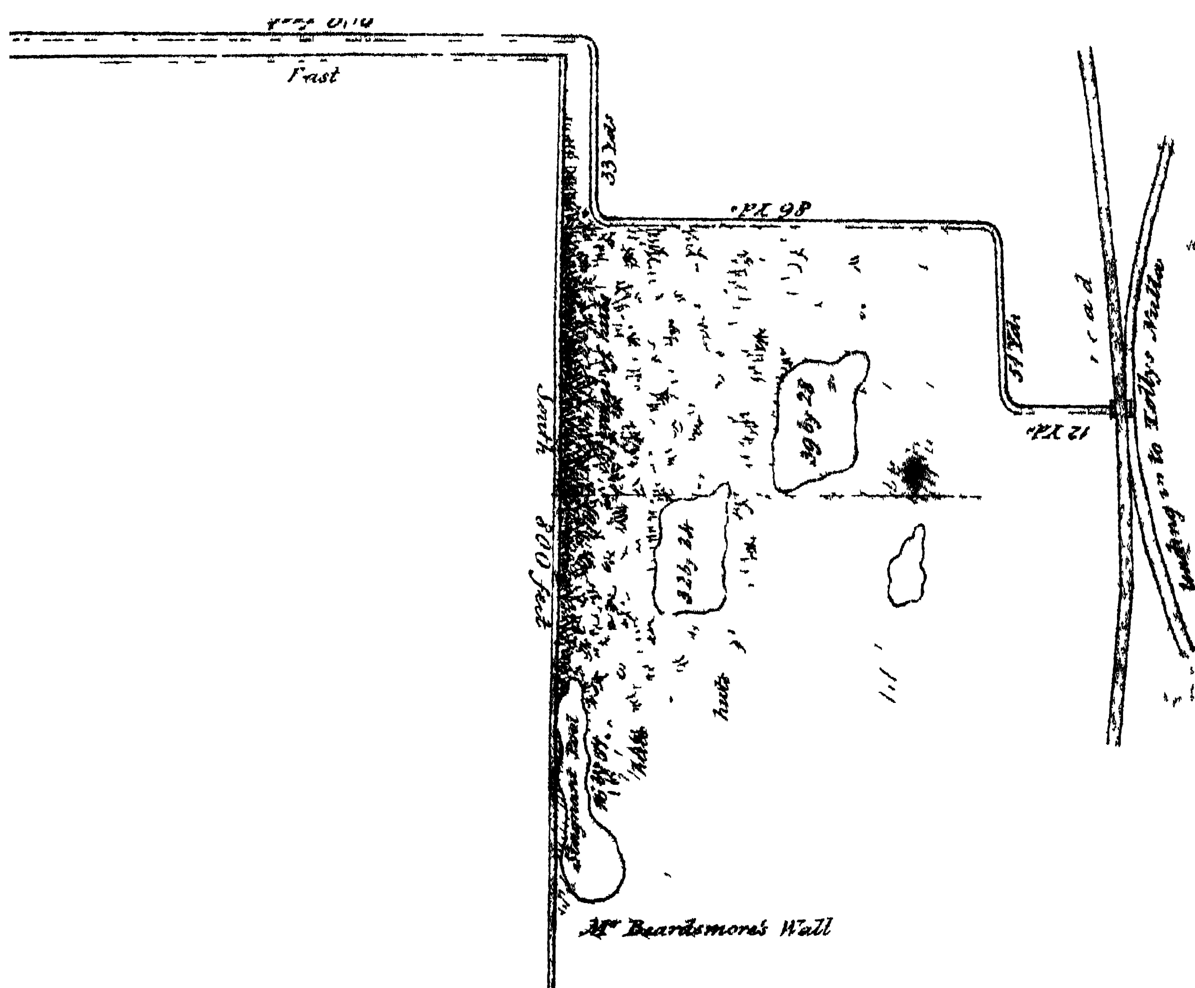
The situation of the Hospitals is as good as any that could be found in the neighbourhood of Fort William; and while the portion of the plain surrounding the enclosure remained clear and unoccupied, it must have formed as eligible a situation for an Hospital as could be desired. But for several years past, the grounds surrounding the Hospitals to the south and east have been greatly neglected.

Between Mr. Beardsmore's houses, which are situated at the south-west angle of the Hospital enclosure, to the south-east corner, the ground is occupied for a considerable distance by Native huts, some of them close up to the wall. Such portions of the ground as are free from huts are covered with rank weeds and trees that in some places nearly overtop the wall. Within this space also there are three or four large pools of dirty water, from which there are no outlets. One of the most offensive of these is close to the wall of the enclosure.

Within a very few years past numbers of Native huts have likewise been erected along the whole eastern face of the Hospital compound, but the huts being here more numerous, less space is left for stagnant water, weeds, and jungle.

There is another nuisance in the neighbourhood of the Hospital, which I believe to be of modern origin, which greatly requires alteration; I mean the open (cutcha) water-course by which the dirty water from the House of Correction passes, and into which, at the north-east angle of the Hospital grounds, the large drain which runs in front of the Hospital terminates. From this point it runs along within from 8 to 12 feet of the Hospital wall for 630 yards, and as it is frequently nearly empty, is often very offensive and disagreeable, and when the wind is from the east, must prove very detrimental to the sick in Hospital.

I know not whether any portion of these grounds be now the property of Government, but I very well remember that thirty years ago a stone pillar stood nearly half a mile south, in rear of the Hospital quarters, which bore the following inscription, "Here terminates the Esplanade of Fort William."


East
33 yds
86 yds
51 yds
12 yds
road
leading to Tolly's Nullah
South 800 feet
39 by 28
32 by 24
huts
Stagnant Pool
Mr Beardsmore's Wall

Soon after the period I mention the stone disappeared, and a portion of the ground between where it stood and the Fort became the property of a private individual, who enclosed it; but it is now again the property of Government, and the new Sudder Dewany Adawlut has been erected upon it.

A line drawn eastward from the situation of the pillar above mentioned to the Rossapugla Road must have probably formed the original boundary of the Esplanade, and would include all the ground which is now in so neglected and offensive a state.

S. NICOLSON,
*Surgeon, General Hospital.*

CALCUTTA,
*September 21st,* 1838.

## No. 37. 8

*Queries by the Committee on the Fever Hospital and Municipal Improvements, to which Answers are requested from*

DR. BAIN,
*Surgeon of the Police Hospital.*

The Governour General in his capacity of Governour of Bengal, has intimated to the Committee his desire that in the report they are to make upon the various subjects referred to them, they should "enter into an examination and review of the funds already "appropriated to charities of a Medical description—of the manner in which they are "applied—of the modes which may be suggested for their increase or improved application—"and of the relative value of these existing Institutions."

In order to enable them to report as required upon the *Police Hospital*—forming one of the most material of these Institutions—they request from Dr. Bain answers to the following queries:—

*Q.* 1. When was the Police Hospital established, and at whose expense? And, what was the number of patients it was originally designed to receive? And what was the sum expended upon its erection?

*A.* Mr. M'Farlan can reply to this.

*Q.* 2. Has it been since enlarged; and if so, for the reception of what number of additional patients, and at what expense?

*A.* Mr. M'Farlan can reply to this.

*Q.* 3. What number of patients is it now capable of receiving?

*A.* It is capable of receiving 140 patients, but a greater number is often accommodated by placing them in the verandahs.

What is its present total establishment of Medical and other attendants? What are the allowances of each, and their total amount per month?

A list of servants, marked No. 1, accompanies this paper; the salary of each individual is given, and the total amount.*

*This Paper is not printed. Vide Appendix C. Paper A. No. 18.

And what, exclusive of these, is the total monthly expense of the Hospital, distinguishing diet and clothing from medicines, and by whom defrayed?

Mr. M'Farlan can reply to this.

*Q.* 4. Of what description are the patients the Hospital receives?

*A.* Every description of poor Europeans and Natives included—males and females are admitted.

Of what religious persuasions, country, and place of abode?

All persuasions, caste, and country, are accommodated without distinction.

*Q.* 5. Is it both a Medical and Surgical Hospital?

*A.* Both Surgical and Medical cases are admitted.

And is it in any way limited in the descriptions of cases of disease, which it receives?

Lepers and Eye diseases are excluded.

How many wards is it divided into, and to what descriptions of disease is each ward appropriated?

The wards are divided into the Christian, Hindoo, and Mahomedan male wards; there is also a ward for females and children. We are unable to class the patients according to the diseases they labour under, on account of the differences in caste and want of room, &c.

*Q.* 6. A table shewing the numbers received, and whether Medical or Surgical cases, cured, died. discharged incurable, and remaining in each year, for the 5 years ending 1837, and the annual expense, distinguishing, (1.) Hospital expenses, as dieting, medicines purchased, and menial attendants. (2.) Surgeon's and Assistants' salaries. (3.) Repairs and miscellaneous charges.

*A.* Mr. M'Farlan can reply to this.

Q. 7. Any observations which Dr. Bain may think it right to add, in order to complete the information desired.

*A.* The only remark I would beg to offer, is with regard to the ventilation of the Police Hospital. In place of having windows and venetian blinds to admit light and air, there are innumerable large holes made in the walls for this purpose, which no doubt answered very well the purpose for which the building was originally constructed, viz., to contain healthy prisoners; but is by no means adapted for an Hospital. I would therefore beg to suggest, that large open windows with blinds, be substituted for the holes in the walls; and in addition, that two sky-lights be opened over each ward.

R. H. BAIN, M. D.
*Police Surgeon.*

No. 38 A

*Further Queries to which Answers are requested from*

DR. BAIN.

*Q.* 1. It is stated in the former answers with which Dr. Bain favoured the Committee, that the wards were divided into the Christian, Hindoo, and Mahomedan male wards; that there is also a ward for females and children; but that they are unable to class the patients according to the diseases they labour under, on account of the difference in caste, and want of room. Is the Committee to understand that there are only four wards, and that there is only one ward for male Hindoos of all castes? If this be so, is it not attended with great inconvenience on account of the difference of castes; or are all the Hindoos received of such low caste as to make their separation in different wards immaterial to their feelings and prejudices?

*A.* The wards are divided as follows—

| | | |
|---|---|---|
| Christian wards for males, divided into two, and will hold .. .. | 20 | Cots. |
| Hindoo male ward will hold .. .. .. .. .. | 35 | Do. |
| Mahomedan, ditto .. .. .. .. .. | 35 | Do. |
| Ward for women and children, ditto . .. .. .. | 35 | Do. |
| Besides the above, there are two rooms denominated Foul Wards, used as occasion may require, for cases of small-pox, venereal putrid ulcers, &c., &c., whether of the male or female sex. Should it happen that they are not both needed for diseases above noticed, the spare room is then used for the accommodation of females suffering from diarrhœa and dysentery. One room is always in demand for women infected with syphilis. These two rooms will contain.. | 15 | Do. |
| | 140 | Do. |
| I might here notice another ward, lent to the Medical College, which might be resumed. It will hold .. .. .. | 20 | Do. |
| Total, .. .. | 160 | Do. |

There is only one ward for the accommodation of male Hindoos of all castes. This circumstance is not attended with so much inconvenience as one would be led to expect. I have on this day, 14th September, 1838, male Hindoos in the ward, of about 25 different castes. I inclose a list with the name and caste of each man.* It very rarely happens that any objection is made to the food given them; those who happen to start objections are indulged with pice in place of food. If able to cook for themselves they do so, otherwise they procure friends to do it for them. It must be borne in mind that the greater number of these men are admitted into Hospital of their own free will; they are not all brought in from off the Streets. Those who make voluntary application for admission have friends often visiting them. Only one man out of 33 in Hospital at this time, (the first on the list submitted) † receives pice to procure and prepare his own food. Their victuals are cooked by a Hindoo of the Koith caste, a native of Cuttack. It will be observed that some of the men are of high caste; and I must also take this opportunity to state, it is not uncommon for a Hindoo to request that he may be transferred to the Mussulman ward, for the purpose of obtaining meat diet.

*Q.* 2. Is there, or is there not, any inconvenience of the sort felt from there being only one ward for the reception, promiscuously, of women of all religions, castes, and descriptions?

*A.* There appears to be less inconvenience among the women than the men, in this matter. Though the women generally occupy one ward, yet they are not promiscuously mixed together. The Christians are at one end, separate from the others. European women are not admitted, they are sent to the General Hospital. The Christian women admitted are very poor indeed, and are Portuguese women of colour; they often prefer being placed among the other women.

* It is not thought necessary to print this Paper.

† He is described as a Chootree of Madras.

*Q.* 3. Are there not women of decent character, though of extreme poverty, received into the Hospital; and if so, are they not thus mixed with women of a different description?

*A.* No doubt this does sometimes happen; in which case care is taken to keep those of decent character as far apart as possible from the others. A part of the ward is sometimes screened off for them, or accommodation is found in one of the rooms.

*Q.* 4. Is there not much inconvenience, both medicinally and otherwise, arising from all patients of the same religion or caste being placed in the same ward, without any separation and classification of different diseases?

*A.* Circumstanced as we are, having Christians, Mussulmans, and Hindoos to deal with, some inconvenience of the kind alluded to, medicinal and physical, must arise from the bringing together in the same ward men of the same religion, but of different diseases; but I have not found it a matter of much importance, while the Hospital is not crowded to excess. It would be better certainly to have different wards for the various diseases under treatment; but, under existing circumstances, first to provide distinct wards for men of different religions, objecting to be in the same ward together, and then to provide distinct apartments for the various diseases of these separate castes, would I think be impossible with our present means of accommodation.

*Q.* 5. Does not this offer an impediment in many cases to their cure?

*A.* If the Hospital were exceedingly crowded, this would probably be the case; but as yet I have met with no difficulty.

*Q.* 6. Are the Committee to understand that subjects of Surgical treatment are received into the same ward with Medical cases; and if so, is this not attended with detrimental effects, both to persons labouring under Medical diseases, from their being compelled to witness the state of Surgical patients and painful Surgical operations, and to the Surgical patients, from their being exposed to the infection of contagious diseases?

*A.* Operations are not performed (without it be a very trifling one) in the wards, or in the presence of the patients. It must also be understood that Medical and Surgical cases are not indiscriminately mixed, though they lie in the same ward. We have the Surgical cases at one end, and the Medical cases at the other end—they meet in the centre of course So long as I have had charge of the Police Hospital, now two years and a half there has been no infection, from contagion, and this may perhaps have been prevented by the precautions taken in having the wards white-washed every quarter, and the floor well strewed daily with lime.

*Q.* 7. It has been stated to the Committee by the late Dr. Vos, that the Police Hospital is filled up with all kinds of people, who have disorders of the most contagious and malignant character; and that it is impossible to recover from fever speedily, if at all, while in the same place with many labouring under the worst of diseases. Are you of opinion that this is a true description of the Police Hospital at present?

*A.* No doubt many of the diseases on admission bear a very bad character; but the danger from infection, in consequence of deteriorated or foul atmosphere therefrom, is much corrected by proper attention to cleanliness and ventilation, and the use of the chloride of lime, if necessary. I cannot say that the cases of fever I have had under me have required any great length of time for recovery.

*Q.* 8. Are you of opinion that the receiving this great variety of patients in the same place, presents the obstacle to recovery, especially from fever, here stated?

*A.* I do not think this great variety of patients obstructs recovery in fever or any other disease, provided the wards are not too much crowded, and are well ventilated, and all cases of gangrene and foul ulcers, &c. excluded, which is strictly attended to, as we have rooms for the express purpose of accommodating these cases.

Q. 9. It has also been stated to the Committee by Dr. Vos, that the Police Hospital is sufficient for receiving those who are destitute; and that the Police people are exceedingly attentive in conveying thither all the poor helpless Natives that are found lying in the publick Street. Are you of opinion that the Hospital is sufficiently large for this purpose? And are you limited by the regulations of the Hospital, or practically by its size, or from a want of resort by other persons, to the receiving persons of the entirely destitute condition here described?

*A.* As yet the Hospital is sufficient in accommodation for the demand made on it. I am not limited by any regulation, and we never reject any destitute person. This Institution is useful in three ways—It admits all cases taken off the Street by the Police; it receives a number who are anxious for Medical advice and accommodation; and, thirdly, it affords advice and medicine to patients who wish to remain Out-door patients.

*Q.* 10. You have stated in your answer to the former queries put to you by the Committee, that the only remark you would beg to offer in regard to the ventilation of the Police Hospital, regards the having windows and venetian blinds, in lieu of innumerable large holes made in the walls for that purpose. Are you of opinion that in respect of site, aspect, and structure, it is well calculated to admit of a free circulation of air, if the improvement you suggest with regard to windows were made?

*A.* I think no place in Calcutta could have been better chosen for such an Asylum, on account of its very centrical situation. If the improvements I have suggested be complied with, as regards windows and sky-lights, I have no doubt the ward will be much improved, and a more free, and better regulated circulation of air will be the result.

Q. 11. Are the sleeping apartments of the patients in your opinion sufficiently raised above the ground to render them free from damp, and noxious exhalations; and are the walls and roofs of the Hospital so constructed, and is it so furnished with verandahs, as to afford sufficient protection from the heat of the climate, and the sudden changes of temperature it is subject to, to prevent so far as possible the obstacles these circumstances present to the cure of disease?

*A.* The floor of the Hospital is rather low, but not damp, excepting in the rainy season. We have good cots, and of convenient height from the ground; many of the patients however prefer lying upon the ground, and nothing will persuade them to the contrary. The Hospital is in my opinion sufficiently furnished with verandahs to afford protection from the sun, and sudden changes of temperature.

R. H. BAIN, M. D.

*Police Surgeon.*

*20th September*, 1838.

## No. 39.

*Queries to which Answers are requested from*

THE CHIEF MAGISTRATE.

*Q.* 1. When was the Police Hospital established, and at whose expense? And what was the number of patients it was originally designed to receive? And what was the sum expended in its erection?

*A.* The earliest records of the Police make mention of an Hospital in 1789. Mr. Blaquiere found it in existence in 1791, when he was Deputy Superintendent of Police. He states that it was then situated on the outskirts of the Town, in hired buildings, calculated to hold from 30 to 40 patients, and was under the charge of a Native Doctor (Coberaj) and Surgeon or Dresser (Puttiwallah). The office *accounts* of 1794 (and they go no further) shew the expense to have been

| | |
|---|---|
| Two Native Doctors per month, .... .... | 15 |
| Rent. .... .... .... .... | 14 |
| Cook. .... .... .... .... | 3 |
| Sicca Rupees, | 32 |

The Native Doctor dieted the patients; his monthly bill used to average 120 Rupees, inclusive of medicines. In 1802, Dr. Buirette (who had rendered service to the European prisoners taken by Tippoo Sultan) was appointed Police Surgeon on a salary of 80 Rupees a month, with an allowance of 20 Rupees a month for palankeen bearers. The same Native establishment was kept up, and the patients dieted as before. The Hospital was removed to Mirzapore into hired buildings. Dr. Lycke succeeded Dr. Buirette. The Surgeon's salary was increased to 150 Rs. a month, and the allowance for palankeen bearers discontinued. The Native establishment remained on the same scale as before. Drs. Frith, Dasouza, M'Gowan, and Vos succeeded Dr. Lycke. No alteration in the salary of the Surgeon was made until 1825, when Dr. Vos received an additional 100 Rs. a month on the recommendation of the Magistrates. Upon his application for an increase, Dr. Vos received an addition of 100 Rs. a month in 1835, viz. as personal allowance 50 Rs. and an additional allowance of 50 Rs.

*Q.* 2. Has it been since enlarged; and if so, for the reception of what numbers of additional patients, and at what expense?

*A.* In 1821-22 a building was erected to the east of the Southern Gowkhanna (Cow-shed) on the Circular Road, at the expense of Government; its exact cost we cannot discover; it probably cost Rs. 4,000, and was calculated to hold from 60 to 70 sick. The accommodation was from time to time enlarged as the number of patients increased, first by enclosing the verandah of the Hospital, and subsequently by erecting straw sheds in the compound. The Native establishment was increased in 1822, after the removal of the Hospital to Intally.

In 1835, the Hospital was removed to Colootollah, into a part of the buildings formerly occupied as the Court of Requests' Jail. On the death of Dr. Vos, in 1836, Dr. Bain was appointed Surgeon, on a salary of 300 Rs. a month; the Native establishment was modified, and greatly increased in December 1835;—it has since remained on the same scale.

In a presentment from the Grand Jury in 1825, the Police Hospital is thus spoken of:—
" We have lastly visited the Police Hospital, an Establishment intended for the re-
" ception and relief of destitute sick and diseased Natives from about the Streets of the
" Town. This benevolent object seems to be very humanely and efficiently discharged
" as far as the means of the Institution allow."

Q. 3. What number of patients is it now capable of containing? What is its present total establishment of Medical and other attendants? What are the allowances of each, and their total amount per month?

And what, exclusive of these, is the total monthly expense of the Hospital, distinguishing diet and clothing from medicines, and by whom defrayed?

Answered by Dr. Bain.

A. All expenses of the Police Hospital are defrayed by Government. The average monthly expenditure for 1837-38 has been,

| | |
|---|---|
| Diet, .... .... | 388 Rs. |
| Medicines, .. .. .. | 40 |
| Clothing, (annual) .. .. | 53 |
| Bedding (ditto) Blankets, Sheets, Mattresses, and Pillows, | 1,086 |

The average monthly numbers of patients during the same period has been

| | |
|---|---|
| Europeans, .. .... | 20 |
| Natives and Native Christians, | 101 |

Q. 4. A table shewing the number received, and whether Medical or Surgical cases, the number cured, died, discharged incurable, and remaining, in each year, for the five years ending 1837, and the annual expense, distinguishing (1st) Hospital expenses, as dieting, medicines purchased, and menial attendants, (2nd) Surgeon's and Assistants' salaries, (3rd) Repairs, and miscellaneous charges.

TABLE.

| | Remaining at close of the year preceding. | Admitted during the year. | Cured and released. | Died. | Remaining at the close of the year |
|---|---|---|---|---|---|
| 1837 | 71 | 1,903 | 1,206 | 641 | 127 |
| 1836 | 105 | 1,313 | 812 | 585 | 71 |
| 1835 | 92 | 1,247 | 618 | 616 | 105 |
| 1834 | 85 | 2,556 | 1,527 | 1,013 | 92 |
| 1838 | 42 | 1,842 | 1,243 | 556 | 85 |
| | | 8,861 | 5,406 | 3,361 | 480 |
| | Average | 1,732 | 1,081 | 672 | 92 |

*Table of Expenditure.*

| | Sicca Rupees. | | | | | | Company's Rupees. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1833 | | | 1834 | | | 1835 | | | 1836 | | | 1837 | | |
| Establishment, .............. | 3,840 | 0 | 0 | 3,810 | 0 | 0 | 4,360 | 8 | 0 | 6,192 | 0 | 0 | 6,921 | 0 | 0 |
| Diet. ...................... | 1,782 | 11 | 3 | 3,272 | 13 | 11 | 2,695 | 13 | 2 | 2,605 | 4 | 4 | *b* 4,293 | 15 | 10 |
| Medicines, .................. | 200 | 0 | 0 | 204 | 0 | 0 | 200 | 0 | 0 | *a* 0 | 0 | 0 | 0 | 0 | 0 |
| Clothing and Bedding, ...... | 222 | 4 | 0 | 365 | 7 | 6 | 381 | 10 | 3 | 477 | 15 | 6 | 495 | 14 | 0 |
| Repairs of Buildings, ........ | 8 | 3 | 9 | 745 | 7 | 1 | 110 | 11 | 10 | *c* 1,595 | 7 | 0 | 138 | 1 | 6 |
| Miscellaneous, .............. | 213 | 4 | 0 | 420 | 8 | 6 | 445 | 8 | 3 | 813 | 7 | 1 | 991 | 14 | 3 |
| Total, .... | 6,296 | 7 | 0 | 8,848 | 5 | 0 | 8,149 | 3 | 6 | 11,684 | 1 | 11 | 12,813 | 13 | 7 |

*a.* The allowance for medicines drawn by the Surgeon in charge was discontinued on the removal of the Hospital in 1835, and the expense included in the Diet Bill.

*b.* This considerable increase is owing to the admission of European patients, who cost here four annas or less, and in the General Hospital one Rupee per day.

*c.* This item is for alterations made to the Buildings in Colootollah for the reception of the patients.

It should be borne in mind, that this Institution maintains much of its original character, viz. a refuge for the miserably destitute. Before its existence, human bodies used sometimes to be seen in the morning in the Streets mangled by jackals, and many persons remained for days in the Streets helpless and dying. The Police, as the only party whose duty peremptorily called upon them to interfere, were obliged to provide a refuge. Up to this day the Institution maintains that character—no indulgence and no comfort is provided, except what can be shewn to be essential to the restoration of health.

The alterations spoken of by Dr. Bain, in reply to the seventh query, will be considered, and if necessary reported to Government. Dr. Bain gave up a part of the building to the Medical College, which can be resumed.

D. M'FARLAN,
*Chief Magistrate.*

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## No. 41.0

FROM SURGEON JAMES HUTCHINSON,
*Secretary Medical Board,*
To THE HONBLE. SIR JOHN GRANT,
*President of the Municipal Committee.*

*Fort William, 25th Sept.* 1838.

SIR,

I am directed by the Medical Board to acknowledge the receipt of your letter dated the 29th ultimo, relative to the Lunatick Asylum at Bhowanipore; and in reply to forward for your information, replies to the questions therein submitted, drawn up by the Proprietor of the Institution.

I have the honour to be,
Sir,
Your most obedient Servant,
J. HUTCHINSON,
*Secretary Medical Board.*

*Queries by the Committee on the Fever Hospital and Municipal Improvements, to which Answers are requested from the Medical Board, superintending the Insane Hospital.*

The Governour General, in his capacity of Governour of Bengal, has intimated to the Committee his desire, that in the report they are to make upon the various subjects referred to them, they should "enter into an examination and review of the funds already appro-" priated to charities of a Medical description—of the manner in which they are applied—" of the modes which may be suggested for their increase or improved application—and of " the relative value of these existing Institutions."

In order to enable them to report as required, upon the *Insane Hospital*, forming one of the most material of these Institutions, they request from the Medical Board answers to the following queries.

Q. 1. What is the nature of this Institution? Is it a private Institution, or a publick one; or is it a mixed Institution, partly private and partly publick; and if so, in what proportion does the Government contribute to the expenses of the Institution: and for the benefit of what description of patients?

Q. 2. Are pauper lunaticks received, and at whose expense are they kept there; and by what means do they receive admission?

Q. 3. What number of patients is it calculated to receive? In what manner are they accommodated? What are the restraints imposed on such as are considered dangerous? And in what manner are the different classes of insane persons separated from each other?

Q. 4. What is the size of the building? Of what materials, and in what manner is it constructed? Of how many apartments does it consist, and of what size? Of what height? And how many persons, in any instance, sleep in one room? How many are there that are kept apart in separate apartments? And what provision is made for yards or gardens in which the patients may take exercise when the climate permits?

Q. 5. Of the persons admitted at the expense of Government, what is the sum paid for each, monthly, to the Asylum?

Q. 6. During the five years ending in 1837, how many pauper lunaticks not Military, and how many Military lunaticks have been received each year, at the expense of the Government? Of these, how many have been cured and discharged? How many have died? And how many remained under treatment at the end of the year 1837?

Q. 7. The Medical Board is requested to add any observations which they may think necessary, in order to complete the information desired.

(True Copies.)

*(Signed)* J. HUTCHINSON,
*Secretary Medical Board.*

*Replies.*

Q. 1. The Institution, as originally established in 1818, was confined to the reception of private patients. In the year 1821, it became of a mixed constitution, by a contract entered into with Government by the present Proprietor and Superintendent, for the accommodation of publick patients, who are, agreeably to the conditions therein stipulated for, found with board, lodging, medical attendance and treatment, together with medicines, apparel, and every description of Hospital requisites, by the Superintendent. There are two classes of publick patients;—the first, which comprises such persons who have moved in the better grades of Society, for whom Government allow monthly the sum of Sicca Rupees one hundred each, and who are supplied by the Superintendent with a better sort of diet, and corresponding apparel. When in a convalescent state, they are encouraged to pass their time in the society of the Superintendent and his family. For all others who do not come under this denomination, styled 'Second Class Patients,' the sum of fifty Sicca Rupees each, per month, is allowed by Government. No further expense is incurred for the patients confined in the Institution at the expense of the State, excepting a salary

of two hundred Sicca Rupees per month, received from Government by the Proprietor, in virtue of his appointment as Superintendent. All classes of Europeans, or their descendants, being Anglo-Asiatics, are eligible for admission.

Q. 2. Pauper lunaticks are received into the Institution at the expense of Government through the channel of the Police, by an order from the Chief Magistrate of Calcutta.

Q. 3. The buildings are calculated to receive from 45 to 50 patients, who are accommodated with separate apartments. With dangerous characters, a strict seclusion is observed, and their paroxysms of fury curbed by the application of a strait waistcoat or manacles—these however are not often resorted to. During any violent paroxysm, the lunatick is kept confined to his own apartment. Patients of the 'First Class,' labouring under a mild degree of insanity, are lodged in the lower floor of the premises occupied by the Proprietor; and such as are of a violent disposition, are lodged in buildings forming a distinct range.

Q 4. Besides the lower floor of the house, in which the Superintendent and Proprietor resides, containing 13 apartments, all boarded, there are three distinct ranges of pucka buildings, secured with iron barred doors and windows, containing 30 rooms, well ventilated, and raised from 1½ to 2½ feet from the ground. The rooms are 15 feet high, and from 14 to 16 feet long, and 10 feet to 13 wide, with verandahs running the whole length of the buildings, 12 feet wide, where the insanes are permitted to exercise themselves during the day There are likewise six other detached apartments available. The grounds attached to the house and buildings measure about nine and a half beegahs, laid out in gravelled walks, where the patients take their morning and evening exercise, guarded by their attendants A separate apartment is invariably allotted to each insane.

Q. 5. Answered at query 1

Q. 6. The following table shews the number of patients received into the Institution on account of Government since the year 1833—how they were disposed of—the casualties which occurred—and the total number left in the Institution at the end of the year 1837, from those admitted during the years 1833 to 1837.

| Years. | Admitted at the expense of the State. | Remaining under treatment at the end of the year. | Military. | Non-Military. | Cured and Discharged. | Died. | Sent to Europe. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| 1833 | 13 | 8 | 7 | 6 | 5 | 0 | 0 | From the 17 remaining under treatment at end of 1837, deduct 3 shipped to Europe—insanes of the preceding years, but disposed of in 1837. |
| 1834 | 10 | 1 | 6 | 4 | 5 | 1 | 3 | |
| 1835 | 12 | 3 | 9 | 3 | 3 | 3 | 3 | |
| 1836 | 13 | 5 | 3 | 10 | 5 | 1 | 2 | |
| 1837 | 9 | 0 | 4 | 5 | 4 | 1 | 4 | |
| Total, | 57 | 17 | 29 | 28 | 22 | 6 | 12 | |

(*Signed*) J. BEARDSMORE, *Superintendent.*
W. RALEIGH, *Surgeon.*

Bhowanipore Lunatick Asylum,
*20th September*, 1838.

# No. 41.

*Additional Queries put to*

## S. NICOLSON, ESQ.

*Q.* 1. The Committee understand that the General Hospital, of which you are Surgeon, has existed for upwards of seventy years, and that during that time great masses of European sick have passed through its wards, and also that they have been subjected to various modes of Medical treatment.

Do the Hospital records enable you to furnish any statistical information on the numerous and important results connected with the history of endemick and epidemick diseases; the influence on these particularly, and on other diseases, of the various modes of Medical management which have been adopted; the ratio of mortality in each disease, particularly in reference to age and sex; whether any diminution of the expenses of the Hospital has been obtained from an improved economical arrangement; and if so, since what time, and by what means? Are the several descriptions of disease under which the patients, who are admitted labour, the dates of their admission, and discharge or demise, the age and sex of the patient, and if discharged whether cured, whether relieved, or whether incurable, and in the case of invalids of Her Majesty's or the Company's European troops whether discharged before being cured, for transmission to England, recorded in the books of the Hospital?

*A.* The Hospital records will not enable me to furnish statistical information on the numerous and important results connected with this query, nor can such be made out from the decayed state of the 121 folio volumes now remaining at the Hospital—the oldest of which only extends as far back as 1796-7.

*Q.* 2. If the older records do not afford you the means of furnishing the above information, do those of a later date; and if so, when were the records altered in form?

*A.* The form and records now in use at the General Hospital, were introduced by Government Regulations, published in General Orders of 1816; but they cannot furnish the information above mentioned.

*Q.* 3. Are the patients in the Hospital counted every day of the year?

*A.* A morning report is made of all the patients remaining in Hospital, those admitted, discharged, or dead daily. Vide Form No. 4.*

*Q.* 4. Is the age of each patient treated in the House exhibited in the quarterly and annual returns; and if so, are they so carefully exhibited as to afford true results as to the influence of treatment on disease; and to what extent do the General Hospital records enable you to state the facts on that particular head, in respect to endemick diseases especially?

*A.* The Journals furnish the only information that can be procured on these subjects, as quarterly and annual returns are only made of Her Majesty's troops. Vide Forms No. 5, 6, 7, 8, 9 and 10.* †

*Q.* 5. Is any history of epidemicks kept at the Presidency General Hospital, or has such ever been kept?

*A.* No histories of epidemicks have ever been kept at the General Hospital, that I am aware of, except the histories of disease recorded in the Journals.

* † These Papers it is not thought necessary to print.

*Q.* 6. Is there any record of the duration of disease, or of the number of days of treatment in each description of disease, and of the influence of age or sex upon both?

*A.* The Journals are the only documents from which such information can be collected.

*Q.* 7. Has there been any, and what diminution in the number of patients admitted into the General Hospital since the establishment of the Hospital for seamen at Howrah? And have you now any, and if any, what number of seamen in the Hospital on the average? And for what diseases?

*A.* A considerable diminution has taken place in the number of seafaring people resorting to the General Hospital since 1834, which may be ascribed to two causes,—1st. The establishment of the Howrah Hospital for seamen; and, 2dly, to the republication of the Hospital Regulations, regarding the admission of patients, in July, 1835.

The correction of the abuse, which rendered the latter measure necessary, contributed in no small degree to diminish the number of sailors resorting to the Hospital. While no admission tickets were required, every sailor who ran from his ship, or overstayed his leave on shore, or got drunk, had only to proceed to the Hospital, and he was immediately admitted,* and while remaining there he was maintained at the Government expense, instead of that of the owner of his ship, as ought to have been the case.

The unnecessary expenditure on the part of Government resulting from this irregularity, will be seen by the following table.

| Description. | Total Number. | Expense to Government. |
|---|---|---|
| Seamen, 1834 .. .. .. .... | 1,474 | 1,474 0 0 |
| Ditto, 1837 .. .. .. .... | 234 | 234 0 0 |
| Saving to Government by inforcing the Regulation, .. | Co's. Rs. .. .. | 1,240 0 0 |

The number of seafaring people in the General Hospital between July, 1835, and 1st of August, 1838, have been on the average about 490 patients per annum.

*Q.* 8. Are you of opinion that the Hospital, without the use of the wings, allotted as a Regimental Hospital to the Queen's troops, is sufficiently large for the greatest number of patients that are likely at any one time to seek relief in it?

*A.* The centre building and the west wing are in my opinion quite sufficient in times of peace to accommodate all the sick that are likely to apply for admission. But I must observe, that on the return of the army from Rangoon, in 1825-6, no fewer than 544 individuals were at one time in the Hospital.

*Q.* 9. If the records afford you the means of stating it with accuracy, or if the records or your own observation enable you to state it with a reasonable approach to accuracy, be pleased in either case to state what may be taken as the average number per diem, for the five years ending 1837, of the patients inhabiting the Hospital?

*A.* The average number of patients per diem in the General Hospital for the five years ending in 1837, was seventy-eight and a fraction, as follows:—

* Note.—The origin of this deviation from the usual Regulations of the Hospital arose, I understand, in the following manner. In 1817, when the cholera raged in Calcutta, directions were given immediately to admit every sick person who was brought to the Hospital, whatever might be his disease. This practice was continued from that time till July, 1835, when the Regulations were republished.

| Years. | | Yearly Total. | |
|---|---|---|---|
| For the year, .. | 1833, | Number of Patients in the General Hospital | 42,234 |
| Ditto, .. | 1834, | Ditto ditto, | 43,822 |
| Ditto, . | 1835, | Ditto ditto, | 27,692 |
| Ditto, .. | 1836, | Ditto ditto, | 15,816 |
| Ditto, .. | 1837. | Ditto ditto, | 14,256 |

Number of days in the above five years 1826. 1,43,820

Yielding an average of sick of $78 \times \frac{696}{913}$ per diem.

S. NICOLSON,

*Surgeon General Hospital.*

*October 5th.* 1838.

## No. 42

*Middleton Row, 24th September,* 1838.

SIR,

In reply to questions put on the part of the Committee on the Fever Hospital and Municipal Improvements regarding the General Hospital, Mr. Nicolson, Surgeon to the Hospital, has furnished me with all the information solicited, except,

First, The Hospital expenses, as dieting, medicines purchased—(or Bazar medicines not supplied from the Company's Dispensary)—clothing, &c.; and, Secondly, Expense of repairs and miscellaneous charges—which he says that he is unable to state, "as all the pecuniary expenditure for diet, &c. is defrayed by the Commissariat;" but he says, "the Medical Board, (as head of the whole Medical Department,) can no doubt easily furnish the Committee with the most authentick and complete information on all those points."

The question on these subjects requested Mr. Nicolson to furnish the Committee with a table, shewing the annual expense in each of the five years ending 1837, distinguished under the two heads mentioned above.

I am therefore led to apply to the Medical Board, to supply that part of the information which is necessarily defective in Mr. Nicolson's answers, and shall be much obliged by your laying this request before them with your earliest convenience.

I have the honour to be, Sir,

Your most obedient and humble Servant,

*(Signed)* J. P. GRANT,

*Chairman Fever Hospital & Municipal Committee.*

To J. HUTCHINSON, ESQ.

*Secretary to the Medical Board.*

## No. 43.

FROM SURGEON JAMES HUTCHINSON,

*Secretary to the Medical Board,*

To THE HONOURABLE SIR JOHN GRANT,

*Chairman of the Fever Hospital and Municipal Committee.*

*Fort William*, 16*th Oct.* 1838.

SIR,

In compliance with the request contained in your letter of the 24th ultimo, I have now the honour, by direction of the Medical Board, to forward to you the annexed Copies of Documents as per margin,* exhibiting the expenses incurred on account of the Presidency General Hospital in the Departments of the Barrack Master of Fort William, the Executive Commissariat Officer at the Presidency, and the Committee of Stationery, for the five years ending with 1837.

The last of these Returns were only received yesterday at this Office.

I have the honour to be,

Sir,

Your most obedient servant

J HUTCHINSON

*Secretary Medical Board*

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## No. 43 (A)

*Statement exhibiting the expenses that have been incurred in the Barrack Department Fort William, on account of repairs to the whole of the Buildings in the Presidency General Hospital Compound and Surgeon's Quarters, from* 1833 *to* 1837.

*Fort William*, 11*th October*, 1838

| | | | | | Amount. | | | Remarks |
|---|---|---|---|---|---|---|---|---|
| To the expenses that have beem incurred in repairing the Presidency General Hospital Buildings in the year | | | | 1833. | 6,205 | 8 | 0 | †The repairs executed by the Gar-rison Engineer. |
| * Ditto, | ditto, | ditto, | do. | 1834. | 0 | 0 | 0 | |
| Ditto, | ditto, | ditto, | do | 1835. | §15,201 | 2 | 7½ | |
| Ditto, | ditto, | ditto, | do. | 1836. | 2,205 | 15 | 10½ | §For annual and Quadrennial repairs |
| Ditto, | ditto, | ditto, | do | 1837. | 3,774 | 6 | 8 | |

*(Signed)* J. R. COLNETT, MAJOR,

*Barrack Master.*

(True Copy,)

J. HUTCHINSON.

*Secretary Medical Board.*

* N B The expenses for the repairs of the General Hospital for 1834, has been applied for, and will be forwarded immediately as it is furnished by the Garrison Engineer.

NOTE The information referred to in this Note, is stated by the Garrison Engineer to amount to 1725 2 10 vide No 18. A

# No. 48 (B)

*Valuation Statement of Stationery supplied to the Presidency General Hospital.*

| Articles. | Quantity. Rm. | Qr. | Shts. | Price per Ream. | Amount. |
|---|---|---|---|---|---|
| *In the year* 1832-33. | | | | | |
| Book Paper .... .... .... | 3 | 0 | 0 | 28 0 0 | 84 0 0 |
| Proportion of charges .... | .. | | .. | .. .. | 14 14 0 |
| Sicca Rupees, .... | .. | | .. | .. .. | 98 14 0 |
| *In the year* 1833-34. | | | | | |
| Consultation Paper .. .... .... | 5 | 0 | 0 | 25 3 6 | 126 1 6 |
| Proportion of charges .... | .. | | .. | .. .. | 17 9 1 |
| Sicca Rupees, .... | .. | | .. | .. .. | 143 10 7 |
| *In the year* 1834-35. | | | | | |
| Book Paper . .. .. .... | 0 | 16 | 0 | 23 13 0 | 19 0 10 |
| Consultation Paper .. .... | 2 | 4 | 0 | 20 11 1 | 45 8 5 |
| | | | | | 64 9 3 |
| Proportion of charges .... | .. | | .. | .. .. | 12 12 6 |
| Sicca Rupees .... | .. | | .. | .. .. | 77 5 9 |
| *In the year* 1835-36. | | | | | |
| Book Paper .. .. .. . | 3 | 0 | 0 | 19 5 3 | 57 15 9 |
| Proportion of charges .... | .. | | .. | .. .. | 12 15 10 |
| Sicca Rupees, .... | .. | | .. | .. .. | 70 15 7 |
| *In the year* 1836-37. | | | | | |
| Book Paper .. .. .... | 1 | 0 | 0 | 19 14 7 | 19 14 7 |
| Proportion of charges .... | .. | | .. | .. .. | 4 4 0 |
| Co's. Rupees, .... | .. | | . | .. .. | 24 2 7 |

*Errors Excepted,*

STATIONERY OFFICE,
10*th October*, 1838.

*(Signed)* H. A. AUBERT,
*Acting Clerk Committee of Stationery.*

True Copy. J. HUTCHINSON,
*Secretary Medical Board.*

# No. 43. ( c. )

*Return of expenses incurred in Dieting Articles, Hospital Clothing. Bazar Medicines and Necessaries, &c supplied to the Presidency General Hospital, from the year 1833 to 1837.*

| | Year 1833. | | | Year 1834. | | | Year 1835. | | | Year 1836. | | | Year 1837. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dieting | Hosp. Clothing and necessaries. | Bazar Medicines. | Dieting. | Hosp Clothing and necessaries. | Bazar Medicines. | Dieting | Hosp. Clothing and necesaries | Bazar Medicines | Dieting. | Hosp Clothing and necessaries. | Bazar Medicines | Dieting | Hosp Clothing and necesaries | Bazar Medicines |
| Jan. | 910 7 2 | 257 8 1 | 94 14 7 | 1,002 8 2¼ | 11 12 9 | 81 0 3 | 1,036 15 0 | 5 12 5 | 87 6 6 | 175 1 2¼ | 4 6 2 | 99 1 4¼ | 681 10 11½ | 6 2 3 | 68 8 6 |
| Feb. | 763 12 1 | 5 5 8 | 83 9 5 | 664 10 5½ | 5 9 3 | 74 12 6 | 813 1 11 | 2,797 11 10 | 91 10 3 | 432 15 3 | 11 13 11 | 50 12 3 | 467 13 10 | 3 7 9 | 49 3 11 |
| Mar. | 1,036 1 8 | 0 0 0 | 90 10 9 | 728 3 2 | 5 7 11 | 69 12 9 | 755 9 1¾ | 5 4 8 | 67 15 3 | 489 11 3 | 3 2 8 | 37 6 11¼ | 382 0 2¾ | 0 0 0 | 45 11 2 |
| April, | 1,000 7 0 | 5 11 0 | 93 5 5 | 842 5 3¼ | 2,600 0 0 | 89 11 11½ | 639 2 11 | 5 1 9 | 83 7 8 | 368 2 5 | 4 3 4 | 47 4 2 | 361 8 ¼ | 3,144 13 3 | 28 15 0 |
| May, | 798 8 6 | 5 3 4 | 81 10 8 | 922 6 0¼ | 5 8 7 | 74 10 6 | 592 2 8½ | 5 14 1 | 55 2 4½ | 363 7 2 | 5 2 10 | 38 11 9 | 369 3 0¼ | 3 12 8 | 33 4 8 |
| June, | 846 4 4 | 5 6 2 | 50 5 2 | 845 1 11 | 6 4 7 | 88 3 1½ | 493 9 3¼ | 4 13 4 | 72 2 6½ | 390 5 9½ | 0 0 0 | 46 5 3 | 367 10 7 | 7 7 1 | 41 5 6 |
| July, | 987 8 0 | 6 2 2 | 105 10 9 | 941 7 6¾ | 5 15 0 | 100 4 0¼ | 565 6 1 | 4 13 1 | 80 15 7 | 407 2 3½ | 5 7 10 | 37 3 3 | 422 12 7 | 4 10 7 | 37 11 2 |
| Aug. | 1,025 11 2 | 5 8 6 | 116 2 6 | 1,014 9 2¼ | 6 13 3 | 136 7 5 | 635 4 5½ | 3 10 10 | 105 2 0 | 372 0 7¾ | 4 11 10 | 34 2 5¼ | 439 3 5 | 4 9 0 | 56 0 11 |
| Sept. | 1,094 2 7 | 7 0 6 | 154 10 4 | 1,038 11 2¾ | 1,278 2 4 | 144 4 8 | 615 6 1½ | 3 10 10 | 99 9 6 | 355 6 4¾ | 3 10 10 | 37 0 3½ | 387 15 6 | 4 13 6 | 55 2 1 |
| Oct. | 1,093 3 3 | 287 6 8 | 93 7 1 | 1.267 4 1 | 8 10 8 | 106 5 4 | 684 6 8¾ | 3 10 10 | 91 8 10 | 376 3 11¼ | 3 12 2 | 35 10 10 | 313 12 10 | 5 1 6 | 0 9 11 |
| Nov. | 1,171 10 9 | 6 4 10 | 84 14 10 | 1,533 7 1¾ | 5 13 0 | 101 7 6¼ | 886 13 11½ | 6 0 0 | 120 7 10 | 582 2 4¼ | 5 5 3 | 44 13 5 | 346 3 0 | 4 13 6 | 69 15 6 |
| Dec. | 1,131 3 4 | 0 0 0 | 149 6 4 | 1,510 10 10 | 5 13 0 | 133 1 5 | 548 13 6¼ | 3,085 3 11½ | 145 9 9¾ | 790 2 0½ | 5 7 10 | 64 8 4½ | 683 4 9 | 9 13 6 | 70 2 6 |
| | 11,858 15 10 | 591 8 11 | 1,198 11 10 | 12,311 5 1¾ | 3,946 14 4 | 1,200 4 5¾ | 8,266 11 9¾ | 5,931 11 10½ | 1,091 2 1¾ | 5,402 15 8¼ | 57 4 8 | 573 0 4¼ | 5,223 2 9¼ | 3,199 8 7 | 556 8 10 |

(Signed) **H. DOVETON,**
*D. A. C. General.*

True Copy.

**J HUTCHINSON,** *Secretary Medical Board.*

FORT WILLIAM,
*Commissariat Office, 8th October, 1838.*

# No 43 (D)

*Return of Establishment and Contingencies supplied to the Presidency General Hospital from the year 1833 to the year 1837*

| | Year 1833 | | Year 1834 | | Year 1835 | | Year 1836. | | Year 1837. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Establishment. | Contingent Charges | Establishment. | Contingent Charges | Establishment. | Contingent Charges | Establishment. | Contingent Charges | Establishment. | Contingent Charges |
| January, .. .. . | 730 8 6 | 40 8 [illegible] | 821 9 9 | 44 5 0 | 784 2 8 | 47 13 9 | 798 9 0 | 43 14 4 | 788 6 3 | 40 14 1 |
| February. .. .. .. | 705 13 8 | 40 13 3 | 738 7 6 | 43 15 9 | 737 4 11 | 44 3 0 | 967 4 2 | 40 1 10 | 722 11 6 | 37 6 10 |
| March .... .. .. | 776 14 11 | 38 1 3 | 787 10 5 | 43 4 0 | 708 5 2 | 44 14 0 | 906 [illegible] 0 | 37 6 4 | 738 3 10 | 40 1 10 |
| April, .. .. .. .. | 799 2 0 | 35 15 9 | 854 11 1 | 43 12 3 | 736 14 7 | 46 11 9 | 1,009 3 1 | 35 15 7 | 753 11 10 | 35 0 10 |
| May .. .. .. .. | 817 6 11 | 37 11 3 | 879 8 8 | 41 14 6 | 797 3 1 | 46 4 6 | 1,068 9 0 | 36 12 11 | 839 14 6 | 37 2 4 |
| June, .. .. .. .. | 828 5 7 | 38 6 0 | 902 13 9 | 41 10 6 | 796 2 10 | 46 6 6 | 990 14 4 | 35 11 4 | 784 11 10 | 36 14 4 |
| July, .. .. .. .. | 794 14 2 | 40 9 9 | 830 1 1 | 43 12 [illegible] | 899 7 4 | 45 6 0 | 761 14 4 | 36 11 1 | 840 3 6 | 36 13 10 |
| August .. .. .. | 891 7 10 | 41 14 0 | 868 12 7 | 41 13 9 | 905 13 4 | 46 2 9 | 777 6 4 | 35 0 1 | 813 3 6 | 35 11 4 |
| September. .. .. | 885 15 6 | 43 11 6 | 938 0 6 | 44 7 7 | 909 10 11 | 46 8 3 | 822 2 4 | 37 14 1 | 809 3 6 | 37 10 10 |
| October, .. .. .. | 877 0 6 | 44 5 3 | 952 4 4 | 46 1 3 | 917 10 11 | 47 15 6 | 809 10 4 | 38 1 1 | 781 11 6 | 29 9 11 |
| November, .. .. | 821 14 7 | 44 11 0 | 1,011 0 9 | 43 11 3 | 983 11 8 | 39 10 9 | 982 15 4 | 41 14 1 | 749 6 2 | 30 4 4 |
| December, .. .. | 926 3 10 | 41 5 6 | 902 5 9 | 43 1 3 | 748 2 8 | 43 4 7 | 965 8 9 | 45 5 1 | 786 3 2 | 32 10 10 |
| | [illegible] 12 0 | 491 1 0 | 10,[illegible] 2 | 521 13 0 | 9,914 11 1 | 543 2 10 | [illegible] 10 0 | 465 13 1 | [illegible] 337 11 1 | 431 5 1 |

(*Signed*) HENRY DOVETON *D. A. C. General*

True Copy

J HUTCHINSON *Secretary Medical Board*

FORT WILLIAM

*Commissariat Office 8th October* 1838.

## No. 44.

To J. HUTCHINSON, ESQ.
*Secretary Medical Board.*

*Middleton Row, 1st October, 1838.*

SIR,

I had lately the honour of transmitting to you certain queries regarding the General Hospital, to which I requested the answers of the Medical Board. I now beg leave to trouble you with some queries relating to the Hospitals in the Provinces which are under the charge of that Board. And as they do not so obviously come within the description of the matters particularly referred to the Fever Hospital and Municipal Committee for inquiry by the Governour of Bengal, I think it right to explain to you as Chairman of the Committee, the relation they bear to one of the most material objects which it is the duty and desire of the Committee to press upon the attentive consideration of the Governour, namely, the construction and establishment of the proposed Hospital or Hospitals on such a footing, as to afford accurate statistical records of tropical diseases in the locality of Calcutta, and it is important in this view to lay before him upon the best evidence, the exact amount of the attention that has been bestowed upon this important matter, in the several Medical establishments under the Government of the Presidency.

It is with a view simply to this point that I, on the part of the Committee beg to trouble the Medical Board with these inquiries.

I beg you to lay this communication before the Board. According to what I am led to believe, the answers will give the Board very little trouble and will require very little time. I request you to state to the Board, that I shall feel much obliged by an early answer as well to these queries as to those formerly transmitted, because I am happy to say that the Report of the Committee is nearly at a close, and will be submitted to them for final approbation or correction very shortly, unless it is delayed by the time taken in returning me the few answers remaining to be obtained from the Medical Board the Surgeon of the General Hospital, and the Civil Architect.

I have, &c.

*(Signed)* J. P. GRANT,

*Chairman Fever Hospital & Municipal Committee.*

## No. 44. (A)

*Questions to which Answers are requested by the Fever Hospital and Municipal Committee from the Members of the Medical Board.*

Q. 1. Are there any Records kept at the several Hospitals in the Provinces under the Presidency of Bengal, which are under the general superintendence of the Medical Board of the precise description of disease under which the several patients who are admitted into Hospital labour, of the dates of their admission, and discharge or demise, and if discharged whether cured, whether relieved, or whether incurable? And do these Hospital records furnish any statistical information on the numerous and important results connected with the history of endemick and epidemick diseases, the influence on diseases, more parti-

cularly on the endemick and epidemick, of the various modes of Medical management, the ratio of mortality in each disease in reference to age and sex, the diminution of cost which has been obtained from an improved economick arrangement in these Hospitals, or any of them, and if so obtained, since what period, and by what means?

*Q.* 2. If the present records of these Hospitals afford the means of acquiring the above information, for how long back do they extend in that form, and in what particulars are they perfect or imperfect?

*Q.* 3. Are the patients in Hospitals counted every day of the year? And is their number recorded, or what means are possessed of knowing the average number of patients daily in Hospital throughout the year, the average daily proportion of sick to well at each station, and the cost of each patient per diem? Are the age and sex of each patient exhibited in the periodical Returns from each Hospital, and if so, are they so accurately exhibited as to afford the true results of different modes of treatment in the several diseases, and in endemick diseases especially?

*Q.* 4. Has any history of epidemicks been kept, or is such history now kept at the several Hospitals that are mentioned?

*Q.* 5. Has any record been kept, or is such record now kept, of the duration of disease, or of the number of days of treatment in each disease, and of the influence of age or of sex upon each disease?

## No. 45.

From SURGEON JAMES HUTCHINSON,
*Secretary to the Medical Board,*
To THE HONBLE. SIR JOHN GRANT,
*President of the Fever Hospital and Municipal Committee.*

*Fort William,* 1*st. Oct.* 1838.

Sir,

1st. I am directed by the Medical Board to acknowledge the receipt of your letter of this day's date, forwarding on the part of the Fever Hospital and Municipal Committee, certain queries relative to the mode of conducting the Medical duties under this Presidency, with the view "to lay before the Honourable the Deputy Governour of "Bengal, upon the best evidence, the exact amount of the attention that has been "bestowed on this important matter in the several Medical establishments under the "Government of the Presidency."

2d. With reference to your communication, the Board have instructed me to furnish you with a copy of the new Code of Medical Regulations, from which the Municipal Committee will see at once not only the various forms of Returns, which are transmitted by superintending Surgeons for the information of the Medical Board; but likewise of those which are furnished by Executive Medical Officers to superintending Surgeons of Divisions

3d. From a perusal of the Code, the Committee will likewise observe, that, with the exception of Jail Hospitals, and a few charitable Institutions, principally of a private character, for affording Medical aid to indigent sick, few or none of the Hospitals from which Reports are received pertain to the Government of Bengal.

4th. From the greater part of the Institutions for affording Medical aid to the poor at the Presidency, although they receive extensive assistance from the publick fund, no

reports whatever, deserving of the name, have yet been directed by the Government; a circumstance which is much to be regretted on several accounts, and which the Board would be glad to see remedied.

5th. The Reports received from Her Majesty's Regiments by the Board are far from complete, the greater portion of their documents of that nature being forwarded by the Executive Medical Officers direct to the Inspector General of Her Majesty's Hospitals.

6th. It may likewise be as well to inform you, that the Medical Board is to a very limited extent a Board of Account, and that they consequently are unable to furnish your Committee with any returns of the expenses incurred by Government in maintaining the several Hospitals throughout the country.

7th. The Board, notwithstanding, desirous of obliging your Committee, have addressed the Commissariat Department, the Civil Architect, the Barrack Master of Fort William, and the Stationery Committee, with the view of ascertaining the expenses of the Presidency General Hospital, as requested in your last letter to their address.

8th. In conclusion the Board desire me to say, that they will be prepared to give any new forms of Medical Returns devised by your Committee, their best consideration, whether forwarded direct by your Committee or referred for the consideration of the Board by the Government of Bengal, or by the Government of India. It may be as well however that your Committee should bear in mind, that these Returns are not wholly of a Medical nature, but that many of them are required by his Excellency the Commander-in-Chief, and other Military authorities, for purposes connected with the General governance of the Medical Department, and with the pay and account of the different Hospital Establishments.

I have the honour to be,
Sir,
Your most obedient Servant,
J. HUTCHINSON,
*Secretary Medical Board.*

## No. 46

*October 17th*, 1838.

Sir,

I had duly the honour to receive your letter of the 1st instant, by directions of the Medical Board, in answer to mine of that date, forwarding certain queries relating to the Hospitals in the Provinces, which are under the charge of the Medical Board; in which letter you inform me, that, with reference to my communication, the Board had instructed you to furnish me with a copy of the new Code of Medical Regulations, from which the Municipal Committee would see at once, not only the various forms of Returns which are transmitted by superintending Surgeons for the information of the Medical Board, but likewise of those which are furnished by Executive Medical Officers to superintending Surgeons of the Division. This book I had also the honour to receive; and I presume that the Committee may conclude, that the Medical Board possesses no further information upon the matters mentioned in the queries I had the honour to transmit on the 1st instant, than such as may be furnished under those forms of Returns, and that the Board is ignorant whether there are any Records kept, at the several Hospitals in the Provinces under the Presidency of Bengal, relative to the points mentioned in the said several queries.

I also observe that you say, that the Medical Board is to a very limited extent a Board of Account, and that they consequently are unable to furnish our Committee with Returns of the expenses incurred by Government in maintaining the several Hospitals throughout the country; and that you state that the Board, notwithstanding, desirous of obliging our Committee, have addressed the Commissariat Department, the Civil Architect, the Barrack Master of Fort William, and the Stationery Committee, with a view of ascertaining the expenses of the Presidency General Hospital, as requested in my former letter to their address.

I am persuaded that the Committee will feel obliged to the members of the Medical Board for the trouble they have taken to procure the information the Committee desire; but I am sorry that I have not yet received any further communication from you, or from the Departments referred to. I have this day had the honour of addressing a letter to the Commissary General, requesting him to forward to me direct, for the use of the Committee, answers to the several queries which I have transmitted to the Medical Board, and which they not having the means, as it appears, of answering, have, I presume, transmitted to him.

I infer from the letter, that the Committee may presume that the Medical Board is not made acquainted with the expenditure of the General Hospital, or any part of it, medical or dietary, and that it exercises no controul in this matter.

I have thought it right to acquaint you with my application direct to the Commissary General, and with the inferences, which, in framing the Report, I should think it right to submit to the Committee, as those which they may draw from the answers returned by the Medical Board.

I have honour to be, Sir,
Your most obedient humble servant,
*(Signed)* J. P. GRANT,
*Chairman Fever Hospital Committee, &c.*

To J. HUTCHINSON, ESQUIRE,
*Secretary Medical Board.*

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## No. 47.

(No. 504.)
FROM SURGEON JAMES HUTCHINSON,
*Secretary to the Medical Board,*
To THE HONBLE. SIR JOHN GRANT,
*Chairman Municipal Committee.*

*Fort William, 19th October, 1838.*

SIR,

I am directed by the Medical Board to acknowledge the receipt of your letter of the 17th instant.

In reply, the Board desire me to acquaint you, that there are Records kept atevery Hospital whatsoever, throughout the Provinces, receiving any degree of assistance from the Publick funds, with the exception of the few Institutions at the Presidency, mentioned in my last letter to your address.

What the precise nature of these Records are, your Committee will readily ascertain by a reference to the Code of Regulations, of which you have been furnished with a copy.

That these Records may not be in every respect perfect, may be true; much however has of late been done to improve them, and much is in course of being done.

In making changes of the sort, you are doubtless aware that a body like the Medical Board must be guided, in a great measure, by the length to which the Government are prepared to support their measures, the means at their disposal, the feelings of their professional brethren, and the sentiments of the Publick.

By these the progress in the course of improvement in the several Departments of the Service must be regulated, and it is satisfactory to the Board to reflect, that the Medical Service, though suffering under much that is calculated to retard and discourage, is in perhaps as forward a state as any other branch of the Publick Service.

In regard to that portion of your letter under reply, which relates to the expenses of the several Hospitals throughout the country, I am directed to acquaint you, that the inferences which you draw of the Medical Board not being in possession of accurate information on the above points, is quite correct.

To furnish the information required, the Board apprehend, would occasion great trouble; but if it be desired, and be necessary, it must be sought for in the several Offices of Audit, viz. those of the Military Board, the Civil Auditor, and Military Auditor General.

The information which you state you have applied for to the Commissary General, relative to the Presidency General Hospital, has been already forwarded from this Office, with the exception of an account of the expenses of the repairs made in 1834, for which application has been made to the Garrison Engineer of Fort William.

The Return in question will be transmitted to you as soon as received at this Office.

I have the honour to be,

Sir,

Your most obedient Servant,

J. HUTCHINSON,

*Secretary to the Medical Board.*

## No. 48.

(No. 514.)

FROM SURGEON JAMES HUTCHINSON,

*Secretary Medical Board,*

To THE HONBLE. SIR JOHN GRANT.

*Chairman Municipal Committee.*

*Fort William, 23d October,* 1838.

SIR,

I am directed by the Medical Board, in continuation of their letter, No. 504, dated the 19th instant, to forward for your information the annexed copy of a letter, No. 64, dated the 19th instant, this day received from the Garrison Engineer, exhibiting the expenses incurred in repairing the Presidency General Hospital during the year 1834.

I have, the honour to be,

Sir,

Your most obedient Servant,

J. HUTCHINSON,

*Secretary Medical Board.*

## No. 48. (A)

(No. 64.)

*From the Garrison Engineer to the Secretary to the Medical Board, dated 19th October, 1838.*

"With reference to your letter, No. 484, dated the 17th instant, I beg to acquaint you, that the expenses incurred on account of Repairs to the Presidency General Hospital for the year 1834, amount to Company's Rupees 3,725 : 2 : 10."

## No. 49.

*October 17th,* 1838.

SIR,

In the absence of any more detailed statistical accounts relating to the General Hospital of this Presidency, it will be satisfactory to have a Return of the numbers of admissions, deaths, and proportions of deaths to admissions, per cent., according to the form which I have the honour to enclose, and which I am informed it will give very little trouble to fill up for the period desired.

I have the honour to be, Sir,
Your most obedient and humble Servant,
*(Signed)* J. P. GRANT,
*Chairman Fever Hospital Committee.*

To J. HUTCHINSON, ESQ.
*Secretary Medical Board.*

## No. 50.

(No. 534.)

FROM SURGEON JAMES HUTCHINSON,
*Secretary Medical Board,*
To THE HONBLE. SIR JOHN GRANT,
*Chairman Municipal Committee.*

*Fort William,* 31*st October,* 1838.

SIR,

I am directed by the Medical Board to acknowledge the receipt of your letter of the 17th instant, and in compliance with the request therein contained, to transmit to you the accompanying Return, exhibiting the numbers who have been admitted into, and who have died in the Presidency General Hospital, together with the proportion which these bear to each other since the year 1808.

Beyond this the Records of the Board do not admit of the Return being prepared.

I have the honour to be, Sir,
Your most obedient Servant,
J. HUTCHINSON,
*Secretary Medical Board.*

# No. 50. (A)

*Comparative Statement of Admissions and Deaths in the Presidency General Hospital for the following years.*

| Years. | In Hospital on 1st of January each year, & admissions during year. | Died. | Ratio per cent. of deaths to admissions. |
|---|---|---|---|
| 1808 .. .. .. | 672 | 83 | |
| 1809 .. .. .. | 429 | 60 | |
| 1810 .. .. .. | 340 | 39 | |
| 1811 .. .. .. | 675 | 59 | |
| 1812 .. .. .. | 597 | 58 | |
| Total, | 2,713 | 299 | 11 |
| 1813 .. .. .. | 1,532 | 103 | |
| 1814 .. .. .. | 325 | 45 | |
| 1815 .. .. .. | 567 | 79 | |
| 1816 .. .. .. | 783 | 100 | |
| 1817 .. .. .. | 1,153 | 123 | |
| Total, | 4,360 | 450 | 10 $\frac{32}{100}$ |
| 1818 .. .. .. | 2,058 | 146 | |
| 1819 .. .. .. | 1,479 | 150 | |
| 1820 .. .. .. | 946 | 143 | |
| 1821 .. .. .. | 803 | 98 | |
| 1822 .. .. .. | 1,139 | 120 | |
| Total, | 6,425 | 657 | 10 $\frac{22}{100}$ |
| 1823 .. .. .. | 1,156 | 104 | |
| 1824 .. .. .. | 1,838 | 140 | |
| 1825 .. .. .. | 2,705 | 254 | |
| 1826 .. .. .. | 2,134 | 307 | |
| 1827 .. .. .. | 1,727 | 234 | |
| Total, | 9,560 | 1,039 | 10 $\frac{76}{100}$ |
| 1828 .. .. .. | 1,353 | 159 | |
| 1829 .. .. .. | 1,625 | 106 | |
| 1830 .. .. .. | 1,352 | 132 | |
| 1831 .. .. .. | 981 | 97 | |
| 1832 .. .. .. | 1,004 | 91 | |
| Total, | 6,315 | 585 | 9 $\frac{26}{100}$ |
| 1833 .. .. .. | 1,581 | 182 | |
| 1834 .. .. .. | 1,623 | 194 | |
| 1835 .. .. .. | 1,141 | 88 | |
| 1836 .. .. .. | 677 | 60 | |
| 1837 .. .. .. | 719 | 53 | |
| Total, | 5,746 | 577 | 10 $\frac{5}{100}$ |

The Returns of the General Hospital anterior to 1808, contain the troops of H. Majesty's and Honourable Company's Service, in addition to other classes; but do not shew the diseases, date of admission, or deaths that occurred. In January, 1808, the new form of Return was brought into use by Dr. Leney.

J. HUTCHINSON, *Secretary Medical Board.*

## No. 51.

*Further Question to which an Answer is desired by the Fever Hospital and Municipal Improvement Committee from*

MR. DACOSTA,

*Secretary to the Native Hospital.*

*Q.* It appears by your answers to the queries formerly put, that in 1829 there were two pensioners under the Will of Dr. Fleming, one at seven Rupees and one at three Rupees per month, whose pensions the Governours of the Hospital undertook to pay during their lives. Were these pensions paid accordingly; and how does this appear by the Books of the Hospital? And how long did they continue to be paid? And when did the pensioners if dead, respectively die, or are they, or is either of them, now living?

*A.* Bundoo Hurkara, who receives seven Rupees a month pension, must have died before the funds of the late Dr. Fleming were made over to the Native Hospital, as no payment appears to have been made to him by the Treasurers, Messrs. Alexander and Co. Chinto Bearer, by the accounts, appears to have been paid by Messrs. Alexander and Co., Treasurers, on the 7th March, 1831, thirty six Rupees, and on the 21st March, 1833, the Sub-Treasurer and Secretary paid Messrs. Wilson, Leyburn, and Frith, as per Mr. G. Beecher's receipt, 36 Rupees on account of Chinto Bearer's pension, about which period the Secretary concludes the Bearer must have died, as no individual has since appeared to claim the pension. Messrs. Alexander and Co., Treasurers, must have made the arrangement for the payment of this pension with Mr. G. Beecher, who resided at the time at Cuttack.

CALCUTTA,
*6th October*, 1838.

W. DACOSTA,
*Secretary.*

## No. 52.

To THE HONOURABLE SIR J. P. GRANT.

DEAR SIR,

Since our conversation of the other day, I have referred to Mr. Dacosta's Table of Expenditure, Appendix F, page 74, and my own Table, page 73, and beg to send you the following corrections of the latter:—

In the amount debited to the Native Hospital, in the five years, is Rupees 17,130, which sum went to defray the excess of expenditure of the Dispensaries beyond their income. This reduces the real mean expenditure of the Native Hospital to Rs. 12,909 : 4 : 8 per annum; from which, deducting the cost of one Dispensary, viz. 7,662, Rupees, leaves 5,247 : 4 : 8; being the actual charge on account of the In-patients of the Native Hospital per annum.

In the Note appended to my former Table, I have taken the cost of Out-patients of the Native Hospital to be less than at the Dispensaries; but it may be more just to consider the cost as equal in both. It is on these grounds that I have deducted the mean annual cost of the Dispensaries from the mean annual cost of the Native Hospital, during five years; and I conceive it to leave the just estimate of cost on account of the In-patients of the Native Hospital, which, taken at a mean of forty men per day, affords the following rate of cost per man per annum, viz. Rs. 131 : 2 : 11.

Yours very truly,
J. R. MARTIN.

NATIVE HOSPITAL,
*October*, 1838.

## No. 52. (A)

| | Mean Daily. | In-patients, or Admissions per annum. | Annual Cost in £'s | Annual cost in Rs. at 10 Rs. to the £ | Average cost of each man per day. Rs. As. P. |
|---|---|---|---|---|---|
| Cambridge, .... | 60 | 775 | 1,379 | 13,790 | 0 10 0 $\frac{19688}{21900}$ |
| Worcester, .... | 96 | 680 | 1,795 | 17,950 | 0 8 2 $\frac{11180}{35040}$ |
| Calcutta Native Hospital, .... | 40 | 973 | ........ | 5,247¼ | 0 5 9 $\frac{80}{14600}$ |

N. B. The reason of the difference of cost of the In-patients in the Worcester and Cambridge Hospital is, that in the former each patient was kept on an average 52 days, while in the latter only 33 days.

The days of treatment at the Native Hospital cannot be ascertained to a nicety, but by the Diet Rolls, 15 days would appear the average days of treatment during four years at the Native Hospital.

*The following is the mean of 21 English Hospitals.*

| | | |
|---|---|---|
| Average number of days each patient is in the House, .. .. .. | | 41·2 |
| Deaths in 100 patients admitted, .. .. ... .. .. .. | | 4·33 |
| Days of Sickness to one death, .. .. .. .. ... .. | | 953· |
| Expense of one patient in twelve months, .. .. .. | £ | 23·5 |

J. R. MARTIN.

## No. 53.

To THE HONOURABLE SIR J. P. GRANT.

Dear Sir,

1st. In reference to the subject of your inquiries, I beg to forward a Table of the Mortality of the British Army. It is a compilation of singular interest and importance, as exhibiting the influence of climate on health, and as comprehending a range of observation over most of the British Colonies, as well as the Home Stations; and a range of observation, as to time, from 1796 to 1832.

2d. With the exception of one brief notice, comprehending four years only in Madras, there is no mention whatever of the subject as affecting the Honourable Company's Troops, European or Native, in all India; the reason is, the absence of any Hospital documents on which to ground statistical Returns. Up to 1836, it would appear that nothing had been obtained by the profession in England, on which to form a judgment as to the influence of climate and locality in the Bengal Presidency, except through the office of the Inspector General of H. M. Hospitals; and nothing is known respecting the state of health of the Royal troops previously to 1822-23, the time when the office of Inspector General of H. M. Hospitals was instituted.

3rd. I have endeavoured to obtain the Tables of the late Dr. Burke, exhibiting the relative influence of climate and disease on Europeans of different ages; but I regret to say without effect. One important fact, however, I am able to state from published authority, viz. that, previously to Dr. Burke's arrival in India, a large proportion of the European recruits sent to this country were under the mature age of manhood, and that it was not till Dr. Burke satisfied the British Government, by information of the most positive nature, grounded on the Hospital statistics, that this system was ordered to be discontinued; Dr. Burke having shewn that the mortality amongst this class of young soldiers was excessive, and out of all proportion to that of the class of men who came to the country with fully formed constitutions.

4th. I beg, at your request, to forward some more blank forms of Hospital records belonging to the Royal and the Honourable Company's Regulations.*

In the forms for the Royal Army Returns, you will observe, that whatever is contained in the case of each soldier treated (including his age as an indispensable item) is carried through to the quarterly and annual Returns, in order that these last may at once exhibit a complete body of statistical information; shewing the mortality and expected duration of different diseases, and the extent to which their mortality is diminished by remedial means; while, in the quarterly and annual Returns for the Honourable Company's Army, there is little that can be rendered available for such purposes. It is true that the age of each man admitted into the Hospitals of the Honourable Company is required to be noted; but so little is the value of this record appreciated, that in none of the quarterly Records is it carried through, as in the Royal army; and thus, that requisite to true statistical information is lost. In short, in the Royal army, the pith and marrow of the Case-book is extracted in the shape of figures, while in that of the Honourable Company it is not so managed.

Yours truly,

J. R. MARTIN.

NATIVE HOSPITAL,
*October 4th*, 1838.

* It is not thought necessary to print these Forms.

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# No. 53 (A)

*Table of Mortality in the British Army.*

| Time and place of observation. | English Army | Extent of observations. | | Annual rate of Mortality per cent. | | |
|---|---|---|---|---|---|---|
| | | Average force. | years | Maxm. | Mean. | Minim. |
| The United Kingdom, .... | British army, .. | 46460 | 10 | | 1·5 | |
| Ireland 1797—1828, .... | ditto, .. | 36921 | 32 | 2·0 | 1·5 | 1·1 |
| Mediterranean :— | | | | | | |
| Malta, 1824—31,........ | The Garrison, .. | 2226 | 8 | 2·8 | 1·5 | 1·0 |
| Gibraltar, 1815—31,....... | Ditto, .. | 3267 | 17 | 13·4 | 2·0 | 0·7 |
| Ionian Islands, ........ | The troops, .. | 2467 | 13 | 3·6 | 2·6 | 1·4 |
| East Indies :— | | | | | | |
| Fort St. George Presidency, (Madras) 1827—30, .... | European troops, (1) .. | 11820 | 4 | 7·1 | 4·8 | 3·2 |
| | Native troops, .. | 69550 | 4 | 1·6 | 1·4 | 1·0 |
| Bengal 1826—32, ...... | European troops, (2).. | 8700 | 7 | 9·7 | 5·7 | 3·8 |
| West Indies :— | | | | | | |
| Windward and Leeward Islands, .... | 1796—1805 ditto, ... | 13610 | 10 | 27·7 | 18·3 | 8·0 |
| | 1810—1828 ditto, .. | 5768 | 19 | 23·4 | 11·3 | 4·7 |
| Jamaica, Honduras, .... | 1810—1828 ditto, . | 2528 | 19 | 47·2 | 15·5 | 7·8 |
| Jamaica, Honduras, Wind. and Leew. Islands, .. | Colonial troops, blacks. | 2733 | 19 | 8·4 | 5·5 | 1·8 |

(1.) Cholera prevailed; and on a mean of the four years, 23 per cent of Europeans, and 45 per cent of the Natives treated, perished.

(2.) Out of 100 deaths in Bengal, 26·8 were from fevers; 7·3 from hepatitis; 30·5 from dysentery and other bowel complaints; 19·8 from cholera; 4·6 from pulmonick diseases, 1·9 of which was phthisis pulmonaris; leaving only 11 produced by other diseases.

N. B. The loss by invaliding was 1·2 per cent on an average; 4·7 in 1826, and only 0·2 in 1830.

The above Table is taken from the British Medical Almanack for the year 1836.

By W. A. BURKE, M. D,

*Inspector General.*

## No. 54.

*Bridga Tullao, 30th August, 1838.*

My Dear Sir,

The following are the statements I intended to have made to the Municipal Committee. Previous to November, 1836, the collections made in the Canals for small boats, generally laden with articles of small value for the markets of Calcutta, amounted to 7000 (Rupees) per annum, at the rate of 4 annas each boat. That in December, 1837, the small boats which entered the Canals, then free from all duty, numbered 770. It was not my intention that any comparison should be drawn between these two facts.

In the first place, the (7000 Rupees × 4 annas) 28,000 boats first referred to, supplied the markets on the banks of the Canals alone, which may be considered as beyond the Town of Calcutta. The principal marts supplied were two grain markets, three fish and vegetable, and one wood market ; from this I inferred, that if an open navigable cut were made through the populous part of Calcutta, communicating at one end with the Hoogly and at the other with the Sunderbunds, that 500 Saltees, or small boats, per diem might be expected to enter.

The average weight of goods brought by each Saltee being supposed to be 10 maunds, I calculated that 5000 *such boats* or 50,000 maunds, was necessary for the daily consumption of the Town of Calcutta.

By referring to the Returns for December, 1837, I find that in addition to the 770 boats which entered free that month, there were 7,680 between 25 maunds and 50 maunds burden, paying 4 annas toll each. These boats are almost entirely for the supply of the Suburbs, Calcutta being supplied by the river Hoogly.

If the foregoing explanation is not satisfactory I shall have much pleasure in replying to any further questions you think requisite.

Yours most sincerely,

J. THOMSON.

To THE HONBLE. SIR J. P. GRANT.

## No. 55.

To THE HONBLE. SIR JOHN GRANT

*Chairman to the Fever Hospital and Municipal Committee.*

Sir,

I have the honour to acknowledge the receipt of your letter, under date the 16th instant, containing certain queries regarding the Return forwarded from my office, which exhibited the expenses incurred for Dieting articles, Hospital clothing, Bazar medicines, and necessaries, &c. supplied to the Presidency General Hospital, from 1833 to 1837. I have in reply to state, that medical comforts, such as wine, sago, &c. are included under the head Dieting ; that the several issues you inquire about, are made on indents, made on the Commissariat by the Surgeon of the General Hospital, countersigned and checked by the superintending Surgeon of the Division, who in exercising controul on such supplies, furnishes me with vouchers with his countersignature affixed thereto.

As regards the variance of the expense of Establishment of the General Hospital in different years, mentioned in my Return alluded to, it is attributable to the decrease, or

increase, in the number of patients, according to which the servants in the Hospital are entertained and discharged, as per monthly Rolls, furnished me from the Hospital.

With regard to the amount of pay of the Establishment for the year 1837, as stated in my Return, being less than the sum mentioned by the Surgeon by about 8000 Rs., I beg to observe, that the salary of the Surgeon, and the first and second Assistant Surgeons, is not included in the amount in my Return, as their allowances are not drawn from my office. Adding the annual pay of these three Officers, viz. Rs. 12,000, to the sum mentioned by me, it would, you will perceive, exceed the amount in the Surgeon's list; but this difference may be accounted for by this circumstance, that Dr. Nicolson's list is incorrect, the salary of one person of each class of servants being merely mentioned, whereas the aggregate amount of pay of the whole number should have been stated.

Hoping these replies may prove satisfactory to your Committee,

I have the honour to be, Sir,

Your most obedient and humble Servant,

HENRY DOVETON,
*Adjutant General.*

FORT WILLIAM, COMMT. OFFICE,
*19th November*, 1838.

## No. 56.

To S. NICOLSON, ESQ.

*Surgeon in charge of the General Hospital.*

SIR,

I have the honour to forward the correct original Table * from which No. 3 Abstract, page 133, was copied; and I regret to see some discrepancy, which must have occurred in the hurry of copying; with this exception the three Tables, Nos. 2, 3, and 4 correspond.

The number of patients, in the above Tables, have been taken from the Monthly Records of Sick, which exhibit the monthly (not daily) number admitted, discharged, or died, and do not of course shew the average number per diem.

The Table shewing the number of sick in the General Hospital, page 148, has been taken from the Diet Abstract Book, and exhibits the whole daily and monthly number of patients dieted and treated, and also shews the average number per diem.

I have the honour to be, Sir,

Your humble Servant,

THOS. CRAWFORD,
*Steward.*

GENERAL HOSPITAL,
*20th November*, 1838.

* The Table No. 3, at page 131, referred to here has been corrected.

# No. 57.

To THE HONBLE SIR J. P. GRANT.

DEAR SIR,

I beg to forward to you a note on a subject which, next to the improvement of the City of Calcutta, I consider of most consequence to its Christian inhabitants especially, and it may, in course of time, even become equally so to the Natives. Perhaps you may consider some notice of it proper to the objects before the Committee, or supplementary to them.

I remain, Dear Sir,

Yours very truly,

J. R. MARTIN.

CALCUTTA,
*November 14th*, 1838.

## ON THE CHOICE OF LOCALITIES FOR THE SICK OF CALCUTTA.

The want of a place of resort in sickness a matter of surprise.

It is a subject of general remark, and some surprise amongst strangers, that no place of resort for sick and convalescents has been established by the inhabitants of this large, and but lately wealthy City. It was but the other day, that capital to any amount might be obtained for the wildest of commercial and other enterprises; and it is much to be regretted that the only attempt of the kind here contemplated, partook but too much of that character.

The Saugor Island Scheme, in 1819.

Had the projectors of the Saugor island scheme confined their views to the banishment of tigers, the growth of rice, and the making of salt, we could have nothing to complain of; but when "Members of Council, Judges of the Supreme Court, Generals, Civil Servants, Divines, Lawyers, Physicians, Military Officers, and Merchants," propose that "farms and granaries, and towns and busy population shall succeed," in defiance of the tides and inundations, "to all the frightful silence of sterility and pestilence;" moreover, when these gentlemen propose to lay out large sums for a "lodging house" on Saugor island, to which the agreeable accompaniments of baths, palanquins, horses, and elephants were to be added—all "*for the benefit of the sick who require sea air,*" it might have been expected that some step had previously been taken to ascertain whether the position really possessed any, and what, capabilities for the residence even of Europeans in health.

That it had not any, even for the latter purpose, the least preliminary examination would have satisfied any one qualified for the task; for had the whole island been as thoroughly cleared as the glacis of Fort William, it had yet in its soil, and in the condition of the immediately surrounding localities, what must for ever have rendered it a place of residence, fatal to all but Molunghees. Altogether, the attempt did little credit to the scientifick or commercial forecast and precaution of so enlightened a community as that of Calcutta, in 1819. The fault, however, must lay chiefly with the "*Physicians;*" for they certainly should have known better. As for the others, they were willing to bestow their capital in promotion of what they believed to be an object of great publick utility; but all hope of success was vain, owing to the signal want of every previous information requisite to give direction and effect to their endeavours.

Wasteful expenditure of life and money in this ill-judged project.

This notable scheme cost from first to last, in human life, including all who died in the clearing operations, and the six thousand odd who perished in the inundation of 1833, more or less, seven thousand souls. It cost in money,—

| | |
|---|---|
| Government preparations for a Light house, .. ... ... .. | 60,000 |
| Expended by the Saugor Island Society, .. ... .. .. | 3,29,000 |
| Expended by the Lessees. .. .. .. .. .. .. | 5,81,000 |
| Total Sa. Rs., ... | 9,70,000 |

Any comment on the above summary, would only destroy the impression. Let us only hope that the next attempt may prove more successful.

Places of resort in former times, according to Doctor Lind.

In former times, we hear, that "the unhealthy town of Calcutta, in Bengal, has in its neighbourhood the healthy situations of Barasette and Ghyrette; where the gentlemen residing in Calcutta should retire in the months of July, August, September, and October. Both Chandanagore and Chinsurah, the French and Dutch Settlements in Bengal, are more healthy than Calcutta." Their necessities drove the older inhabitants to seek shelter, during the period of danger, in the healthier localities mentioned by Dr. Lind; and admitting their superiority over Calcutta, the advantages to the sick must yet have been small. I see the same measure continually under trial here, from the want of a better resource, and in severe cases, with little or no benefit; indeed, there is but one direction that offers a fair chance of recovery to the really sick, and that is, the neighbourhood of the sea, or an insular climate. It is to these, above all others, that the inhabitants of Calcutta should look; and there is not a year that I do not witness the most lamentable sacrifice of health, and of life too, from want of such a place of resort, especially during the South West Monsoon, when persons in a state of extreme illness are unable to undertake a long voyage, in the face of such a wind, and a southern winter.

Their advantages but small compared to the real wants of the sick.

An insular position, or one on the sea coast the most desirable.

Results of the Author's experience on this head.

From an extensive observation of the effects on health of a residence in the mountain ranges, I should be disposed to consider them as chiefly beneficial in *preserving* health, and in this sense they will always be found of the greatest importance to military prophylacis. I see officers in great numbers every year proceeding to the Cape and to England, in whose cases a residence of one or two seasons in the Hills has been insufficient to overcome the habit of recurrence even of common intermittent fever. I have witnessed better results in a great variety of instances from a two month's voyage to sea; such is its superior influence on health.

The result of an extensive personal observation would therefore lead me to the conclusion, that when Europeans have contracted disease, or are suffering from protracted convalescence in the marshes of Bengal, there are distinctive characters which give a preference to an insular climate over every other—viz. the purity of its atmosphere, and its equability of temperature, both which are enjoyed by an insular position in a degree no where else to be found.

In Madeira, for instance, the winter is 12° *warmer* than in Italy or France, while the summer is 5° *cooler*; and while the mean annual range at Maderia is only 14°, it is double that amount at Pisa, Rome, Naples, and Nice.

Malte Brun's preference of an insular climate.

Malte Brun, again, speaking of the air of open and elevated plains as conducive to health and longevity, remarks, that "the same thing may be said of an insular atmosphere, which is always renovated by the breezes from the sea."

The nearer mountain ranges have of late been looked to with much solicitude by the inhabitants of Calcutta; but without comparing the qualities of their atmosphere or reckoning the difficulties to the really sick in reaching such places. My own experience, together with the results all over India, lead me to the conclusion already stated.

The climate of the mountain ranges inferior.

But it is not alone to the sick that a suitable place of resort is necessary, as a means of recovery; the healthy are also in need of it, as a means of prevention during the unhealthy months, but especially such of them as are not inured to the climate. To these last it will afford one valuable protection—that from an otherwise very probable attack of serious illness within the first year of their arrival in the country. An accident from which many will otherwise inevitably suffer.

Importance of the subject even to persons in health, and considered as a measure of prevention.

Pooree and Amherst Island, situated on the opposite shores of the Bay of Bengal, have been talked of as eligible places for the sick of Calcutta, and so have some positions along the sands of Balasore; but as the localities on the western shore only pretend to salubrity during the hot months, and are then inconvenient, if not difficult of access, no serious steps have ever been taken regarding them. Some of the smaller islands on the coast of Arrakan might reward the trouble of examination; but in the absence of information regarding these last, it has always appeared to me that our ancient establishment of Negrais merits our especial notice, and that amongst the least of its advantages may be numbered its proximity to Calcutta and Madras, being but four days steaming from the former, and its accessibility at all seasons. Its insular climate too—its geological character—its free exposure to the influence of the South West Monsoon during eight months of the year—its noble harbour, easy of ingress and egress under every change of season—all point it out as a place of the highest promise; in short, next to the improvement of our City, the possession of some such place of resort for its sick, is the desideratum.

Pooree and Amherst island have been spoken of as places of resort.

Preference given by the Author to the ancient British settlement of Negrais.

The country adjoining Negrais, the Delta of the Irrawaddy, is very unlike that of the Ganges, being generally salubrious. This quality is observed by Dr. Francis Hamilton, who accompanied Colonel Symes on his first embassy to Ava, to the "anastomosing branches of the Pegue rivers," which carry off the "superfluous water, and prevent it from corrupting the air."

Salubrious nature of the Delta of the Irrawaddy.

The geological nature of the soil, as described by Dr. Hamilton, would also seem to contribute materially to this end, by affording a considerable fall towards the sea; for he speaks of rocks, eminences, and ridges of considerable length; all which give to the valley of the Irrawaddy its acknowledged advantages over ours.

The indisputable superiority of the Burmans, amongst the nations inhabiting the vast Peninsula that separates the gulph of Bengal from the sea of China, is doubtless to be ascribed mainly to their fine climate; for, in their habits of life, diet, &c. they are even below the natives of Hindustan.

Climate of Pegue of acknowledged salubrity.

It is then to their climate, and to nothing else, that they owe their superior physical development. Their entire exemption also from the prejudices of *caste* gives them a great moral superiority, which leaves them open to a degree of improvement here unattainable.

Dr. F. Hamilton speaks of Rangoon as "situated in a very healthy and fertile country, near the former town of Tagoon, very unlike Calcutta, Dacca, or the intermediate places, which are still more unhealthy."

The destruction of the Rangoon European forces by causes other than climate.

Those amongst us who would judge the climate of Pegue by the fate of the European army at Rangoon, must be told, that, neither there nor any where else were the soldiers cut off by tropical diseases, as in India. It was scorbutick disease, and that alone, that destroyed the force; and this terrible scourge was no more affected in its progress by the climate of Pegue than would have happened at any of our best stations in India during the rainy season.

Comparative exemption in the Native portion of the army.

Climate, in short, was one of the very least of the causes that led to the destruction of the European force; and this truth is amply borne out by the healthy condition of the native portion of the army.

The writer of these notes served with the forces under Sir Archibald Campbell, with which he marched from Rangoon to Upper Ava.

The climate throughout was both agreeable and salubrious; and with all the hardships and privations of the two campaigns, there were but few deaths in the Body Guard, other than casualties in the field.

Colonel Symes speaks every where in the most favourable manner of the climate, in which during his long residence he "lost only one man by disease." Lastly, of the more immediate object of this inquiry—Negrais. Mr. Crawfurd, while Civil Commissioner in Pegue reports, that "the result of all his inquiries on the subject is, that the climate is considered by the natives perfectly salubrious." Doubtless, three quarters of a century of utter neglect is sufficient to injure the best locality, and Negrais must stand in need of that, without which no climate ever can be really salubrious—*the labour of man.*

Advantages of Negrais in a Naval, Military, and Commercial sense.

As this subject is one of great importance, I beg, though it be a digression, to state some reasons in favour of Negrais as a Naval, Military, and Commercial position. That its harbour is extensive and commodious, affording "perfect shelter and smooth water" both for anchorage and for the construction of wharfs, we have the authority of Admiral Sir Edward Owen. Of the River also, the same distinguished officer says, that it "affords naturally one of the best positions for a naval station on the east side of the Bay of Bengal; nor is it less adapted for the purposes of commerce, having water to Bassien, near 60 miles above its mouth, for ships of the largest size, and for 40 miles higher up for those of 300 tons: its other inland water communications are innumerable, joining the main branch of the Irrawaddy in lat. about 17° 40′ north, thereby affording a direct communication to the heart of the kingdom of Ava, as well as to the city itself."

The island is described by Sir Edward as "an abrupt height rising from a level plain, and might be made almost impregnable." He further adds, that it affords a constant supply of fresh water.

Colonel Burney while Resident at Ava, February 1837, wrote as follows to the address of the author: "Your scheme of taking possession of Negrais and forming a sanatarium there, is so good, that ever since the receipt of your letter, I have been turning the matter over in my mind.—If we took possession of Negrais, it would soon become a second Singapore, and all the English merchants at Rangoon would remove to it. In another war with France, Negrais would prove a splendid port for our vessels of war to victual and refit during both monsoons, and a settlement there could communicate with the seat of government at Calcutta in about the same number of days at all seasons of the year."

The advantages above stated are certainly very great, and it appears to me that Rangoon shares largely in them. With Negrais, Rangoon, and Bassein, we should

padlock the military energies of the Burmese, by placing our garrisons at the mouths of their two greatest rivers ; besides eliciting, for the benefit of both countries, the commercial resources of Pegue and Ava.

The positions of Negrais and Rangoon too, might be retained with ease by a trifling force against any efforts of the Burmahs to dispossess us—a great advantage over the Tenasserim and Arrakan provinces, which do not repay the cost of their retention ; indeed, on the contrary, the former alone are stated by Major Sutherland to cost "ten or twelve lakhs a year."

The only excuse I have ever heard for holding the latter province, so destructive to European and Native health is, its forming what is called a good military frontier towards Ava. But, were a range of mountains a better barrier than the history of most countries and of most wars proves it to be, we do not now, and cannot at any time, stand in need of such a protection against the Burmahs :—the question is otherwise in respect to the *Indus*, the ultimate line of real security to our empire, and the only one necessary to us in a military sense. *(Signed)* J. R. MARTIN.

## No. 58.

To THE HONBLE. SIR J. P. GRANT.
*President of the Fever Hospital Committee.*

SIR,

I have the honour to acknowledge receipt of your letter of the 24th instant. With the exception of the Surgeon's and two Assistant Surgeon's salaries—aggregate amount 1000 Rupees per mensem—the total General Hospital Charge for Medical superintendence and Servants' pay, is defrayed by the Commissariat. The Apothecary's pay of Rs. 150, forms therefore portion of my monthly disbursements, and the item was included in my former Returns of Establishments. As regards the other discrepancy in my letter, which you bring to my notice, if you will have the goodness again to turn to it, you will find the following words in the middle of the third paragraph—"adding the *annual* pay of these three Officers, viz. Rs. 12,000, to the sum mentioned by me, &c. &c. ;" which sufficiently explain, that this sum had only to be added to the other yearly expenses of the Hospital previously submitted in my Returns, to bring out a correct total.

I regret to say, that I have it not in my power to supply the other important information you are desirous of obtaining, regarding the daily number of patients in the General Hospital, during the past five years. The only Paper furnished me, for the purpose of bringing forward the expenditure of patients' diet, is the *abstract* of Diet Rolls, which merely shews the quantity of each article consumed in the Hospital during a month, without letting me into the secret of the number of patients on whose account the articles were supplied. I believe, however, you will be able to obtain the required information, on applying to the Superintending Surgeon at the Presidency, Dr. Smith of the Medical Board, in whose office the original Diet Rolls, shewing the number of patients daily in the General Hospital, are lodged.

Assuring you that no apology was necessary on your part, to ensure my ready attention to the requests so politely conveyed in your letter under reply,

I have the honour to be, Sir,
Your most obedient and humble servant,
HENRY DOVETON, *Adjutant General*

FORT WILLIAM, COMMIST. OFFICE,
*26th November*, 1838.

## No. 59

### To THE HONBLE. SIR J. P. GRANT.

DEAR SIR,

In reference to the subject of your inquiries regarding the economick arrangement of Military Hospitals in England, and of the British Colonies, I beg to state, that they are based on a principle forced upon the British Government, in opposition to very powerful official and other influences, by the representations of the late Dr. Robert Jackson, Deputy Inspector General of Hospitals in Her Majesty's army—perhaps the ablest military Physician of any age or country.

The principle established by Dr. Jackson, simple like that of all great plans, was, "that the sum of money which feeds a soldier in Barracks is sufficient to feed him, and to furnish him with necessary comforts in Hospital." The Medical Department occasions, in such case, no expense to the State, beyond the salary of Medical officers, medicines, lodging, and some extra equipment of furniture. "The principle," says Dr. Jackson, "is an important one; and it is fit that the Military officer consider it in all its extent, so as rightly to comprehend the principle through which the operation of so great economy (as compared with past times) has been accomplished."

The system of Dr. Jackson has worked even beyond his expectation; for a surplus of Hospital stoppages exists in the accounts of the British army of fifty thousand pounds sterling per annum; a sum that must go far to defray those other items not contemplated in the original plan of Dr. Jackson. This excess, however, is an additional proof of its excellence; for all who know the British soldier, must be aware, that he is morally and physically the better for the stoppages made from his pay, as it is notorious how indifferently he uses what remains at his disposal, and that consequently the balance spoken of is well used when applied to his comfort in the Regimental Hospital

It is evident from the whole of the writings of this celebrated Physician, that he never contemplated the possibility of the Medical officers of Hospitals, and who are the only persons to order expenditure, remaining ignorant of the nature of that expenditure; a course that would have been destructive of all improvement, whether medical or economick, had the opponents of Dr. Jackson's plan of management succeeded in their endeavours to continue the old system. Of the value of Medical officers being acquainted with the Hospital finance, again, I may mention that of the abolition, through Dr. Jackson, of the contract formerly held by the Colonial Colonels, by which a saving of eighty thousand pounds sterling per annum was effected in the West Indian Colonies alone, through the commutation *ad valorem*, of fresh meat in place of salt, soft bread instead of biscuits, and wine in place of rum; with the power of augmenting one part of the rations, and diminishing others, at the discretion of the Medical officers. "By this plan," says Dr. Jackson, "the comfort of the sick was increased, for it did not depend upon the liberality of a contractor."

Yours truly,

*(Signed)* J. R. MARTIN

NATIVE HOSPITAL, CALCUTTA.
*December 3rd*, 1838.

## No. 60.

My Dear Sir John, — 8th December, 1838.

The errours in the former Tables arose from adding repeatedly those remaining in Hospital to the admissions. That has been now corrected after a great deal of trouble, from the Forms of our Returns being so different.

Yours sincerely,

*(Signed)* S. NICOLSON.

To THE HONBLE. SIR J. P. GRANT.

## No. 60. (A)

*Amended Answers made to Queries* of the Committee on the Fever Hospital and Municipal Improvements, by*

S. NICOLSON, ESQ.

*Surgeon to the Presidency General Hospital.*

Q. 6. What are the descriptions of persons, and in what relative proportions, except the Military, who usually apply to it for relief?

*A.* Sailors, Government Marine Servants, Towns-people, and Paupers, are the descriptions of persons admitted into the Hospital, independent of the Military patients.

The proportions they bear to the Military are nearly as two to one. The total number of the former classes for five years, ending 31st December, 1837, being 3505 patients, and that of the Military for the same period being 2242 or $1\frac{3}{4}$ to 1 Military.

*Abstract shewing the number of Military under Medical treatment in the General Hospital, from 1st January, 1833, to 31st December, 1837.*

| Years. | Remaining in Hospital, 1st January. | Admitted. | Total. | Discharged. | Died. | Remaining 31st December. |
|---|---|---|---|---|---|---|
| Under Treatment, 1833 | 51 | 390 | 441 | 394 | 22 | 25 |
| Ditto, 1834 | 25 | 403 | 428 | 374 | 21 | 33 |
| Ditto, 1835 | 33 | 605 | 638 | 587 | 26 | 25 |
| Ditto, 1836 | 25 | 300 | 325 | 266 | 15 | 44 |
| Ditto, 1837 | 44 | 366 | 410 | 321 | 15 | 74 |
| Total for five years, | 178 | 2,064 | 2,242 | 1,942 | 99 | 201 |

N. B. This Table only includes the number remaining on 1st of January, and number of admissions each year.—Vide Return Books of Queen's and Honourable Company's Troops.

* Vide page 133.

*Abstract Statement of the Non-Military Classes treated in the General Hospital from 1st January, 1833, to 31st December, 1837, inclusive.*

## No. 60. (B)

| Years. | Townsmen, Clerks, Indigo People, &c. | | | | | | *As Seamen.* H. C. Marine, Harbour Master Dept. Steam Dept. H. M. Navy, Semaphore and Lighthouse Departments. | | | | | | Paupers. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Remained. | Admitted. | Total. | Discharged. | Died. | Remaining. | Remained. | Admitted. | Total. | Discharged. | Died. | Remaining. | Remained. | Admitted. | Total. | Discharged. | Died. | Remaining. |
| Total number in 1833 .. . .... | 1 | 13 | 14 | 9 | 1 | 4 | 22 | 440 | 462 | 354 | 58 | 50 | 52 | 614 | 666 | 519 | 101 | 46 |
| —— Ditto, 1834 .... .... | 4 | 4 | 8 | 7 | 0 | 1 | 50 | 453 | 503 | 417 | 63 | 23 | 46 | 643 | 689 | 536 | 110 | 43 |
| —— Ditto, 1835 .... .... | 1 | 28 | 29 | 22 | 4 | 3 | 23 | 96 | 119 | 95 | 11 | 13 | 43 | 312 | 355 | 295 | 47 | 13 |
| —— Ditto, 1836 . .. .... | 3 | 53 | 56 | 43 | 8 | 5 | 13 | 135 | 148 | 105 | 18 | 25 | 13 | 135 | 148 | 121 | 19 | 8 |
| —— Ditto, 1837 .... .... | 5 | 59 | 64 | 54 | 6 | 4 | 25 | 108 | 133 | 108 | 30 | 12 | 8 | 103 | 111 | 86 | 19 | 6 |
| Total for five years. ....... | 14 | 157 | 171 | 135 | 19 | 17 | 133 | 1,232 | 1,365 | 1,079 | 163 | 123 | 162 | 1,807 | 1,969 | 1,557 | 296 | 116 |

N. B. This Table shews the number of each class remaining 1st January each year, and number admitted during five years.—Vide Non-Military Return.

# No. 60. (c)

*An Abstract Statement shewing the number of Surgical, Medical, and Miscellaneous Cases under treatment at the General Hospital. from 1st January, 1833, to 31st December, 1837, inclusive.*

| Years. | Surgical. | | | | | | Medical. | | | | | | Miscellaneous. | | | | | | Total on the 1st Jan. each year, and admissions during year. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Remained. | Admitted. | Total. | Discharged. | Died. | Remaining. | Remained. | Admitted. | Total. | Discharged. | Died. | Remaining. | Remained. | Admitted. | Total. | Discharged. | Died. | Remaining. | |
| Total No. in 1833 .. .. .. .. .. .. | 30 | 162 | 192 | 163 | 7 | 22 | 72 | 1,137 | 1,209 | 968 | 159 | 82 | 24 | 158 | 182 | 145 | 16 | 21 | 1,583 |
| Do. 1834 .. .. .. .. .. .. | 22 | 240 | 262 | 223 | 6 | 33 | 82 | 998 | 1,080 | 866 | 168 | 46 | 21 | 265 | 286 | 245 | 20 | 21 | 1,628 |
| Do. 1835 .. .. .. .. .. .. | 33 | 237 | 270 | 244 | 5 | 21 | 46 | 643 | 689 | 598 | 76 | 25 | 21 | 161 | 182 | 167 | 7 | 8 | 1,141 |
| Do. 1836 .. .. .. .. .. .. | 21 | 146 | 167 | 129 | 6 | 32 | 25 | 375 | 400 | 319 | 56 | 31 | 8 | 102 | 110 | 87 | 4 | 19 | 677 |
| Do. 1837 .. .. .. .. .. .. | 32 | 103 | 135 | 101 | 3 | 31 | 31 | 354 | 385 | 303 | 44 | 38 | 19 | 179 | 198 | 165 | 6 | 27 | 718 |
| Total for five years. .. .. .. .. | 138 | 888 | 1.026 | 860 | 27 | 139 | 256 | 3,517 | 3,763 | 3,054 | 497 | 222 | 93 | 865 | 958 | 809 | 53 | 96 | 5,747 |

N B.—This Table only includes the number remaining 1st January each year, and Admissions during the year.—Vide Monthly Return.

## No. 60. (D)

*A.* The average number of patients per diem in the General Hospital, for the five years ending in 1837, was* seventy-eight and a fraction, as follows:—

*Average Abstract of Sick for five years.*

| Years. | Total Number of Patients yearly. | Total yearly Average. | Total monthly Average. | Daily Average. |
|---|---|---|---|---|
| 1833 | 42,234 | 8,519 $\frac{1}{2}$ | 1,407 $\frac{4}{5}$ | 110 $\frac{84}{365}$ |
| 1834 | 43,822 | 3,651 $\frac{5}{6}$ | 1,460 $\frac{11}{15}$ | 120 $\frac{22}{365}$ |
| 1835 | 27,692 | 2,307 $\frac{2}{3}$ | 923 $\frac{1}{15}$ | 75 $\frac{317}{365}$ |
| 1836 | 15,816 | 1,318 | 527 $\frac{1}{5}$ | 43 $\frac{191}{365}$ |
| 1837 | 14,256 | 11,88 | 475 $\frac{1}{5}$ | 39 $\frac{11}{365}$ |
| Total for five years, | 1,43,820 | 2,397 | 958 $\frac{4}{5}$ | 78 $\frac{696}{913}$ |

Vide Diet Abstract Return Book, No. 1.

* Vide page 148.

## No. 61.

To CAPTAIN FITZGERALD.

*Calcutta, 30th August*, 1838.

SIR,

In reference to your former communication to the Fever Hospital and Municipal Improvement Committee of 10th May, 1837, in which you stated your inability to furnish the Committee with a plan and estimate of an Hospital, without further information regarding the description of Hospital required, I have now the honour to transmit to you the several queries which have been submitted to Mr. Nicolson and Mr. Martin, the Medical members of the Committee, and their answers—specifying the Medical requisites—and requisites in respect to the separation of religions and castes—which ought to be provided for in such an Hospital erected in Calcutta.

Taking the number of patients whose reception is to be provided for at two hundred and fifty—and their distribution into separate Wards to be such as the answers of these gentlemen point out—and such to be the elevation and general size of the apartments—and such the requisite accommodations for Medical and other attendants—it is requested that in framing your design, you will add to their suggestions the results of your own architectural and military knowledge and experience as to the most advisable construction of an Hospital in a damp and tropical climate, such as that of Calcutta, for the reception and cure of natives of the country labouring under Fever, Dysentery, and other complaints denominated *Medical*, in opposition to *Surgical* cases.

The Committee have only to state generally in regard to the structure, that the first object to be attended to is, that the plan be as perfect for the accomplishment of the cure of the sick as can be devised in the present state of knowledge on the subject. The second, that the structure be such, and of such materials, as to ensure the greatest durability, and the least frequent necessity for repairs that the country and climate admit. And the third, that the greatest economy be observed which is consistent with the accomplishment of these objects—and with the bestowing upon the exterior of the building the pleasing proportions and the classical chastity which ought to mark a publick building in this Capital, erected not for ornament only, but for a purpose of great and grave utility.

1. One plan and estimate is requested for one Hospital for the reception of 250 patients, as stated above.

2. Two plans and estimates are requested for two Hospitals—the same with the large Hospital first mentioned *in every respect* except in size—one Hospital to receive 30 patients, with suitable apartments for an European Apothecary—and one Hospital to receive 20 patients, with such apartments for an European Apothecary; the number of attendants in each Hospital being in the same proportion to the number of patients as in the large Hospital first mentioned, except the Apothecaries.

The members of the Committee who have agreed to recommend the establishment of small Hospitals in lieu of one large central Hospital, contemplate their being erected on detached sites, at considerable distances from each other; and their number being 12—one to contain 30 beds, and 11 to contain 20 beds each. Although therefore, two plans only are required, with separate estimates, the general estimate of the whole expense must be framed for the building of the twelve small detached Hospitals described.

Each of these twelve small Hospitals is intended likewise to serve the purposes of a Dispensary; and two apartments on the ground floor of each Hospital must therefore be assigned and fitted up for the reception of Dispensary patients and distribution of Dispensary medicines—one for male and one for female patients.

3. A plan and estimate—or addition to the plan and estimate of the *large Hospital*—is requested for Lying-in-Wards, if determined to be added to the large Hospital, of the size and description mentioned by Messrs. Nicolson and Martin.

4. An addition to the plan and estimate of the large Hospital mentioned is requested, shewing the disposition and additional expense of four Wards for Surgical cases, to be added to the Fever Hospital, capable of receiving sixty Surgical cases in all. One Ward for high caste and one for low caste Hindoos—one for Mussulmans—and one for Christians and Jews—in the same proportions, in point of number, of each description, as is laid down for the patients in the Fever Hospital. But as these Wards will be small, care must be taken so to construct the divisions as to provide for a free circulation of air. *Lastly*, the large Fever Hospital proposed, must be so constructed as to admit of future enlargement as occasion shall require, and funds admit, to the extent of adding one-fifth more, or fifty Medical patients, without destroying the symmetry of the building, or the Medical advantages of its construction.

I have the honour to be,

Sir,

Your most obedient humble servant,

J. P. GRANT,

*Chairman Fever Hospital & Municipal Improvement Committee.*

---

## No. 62.

No. 386

To THE HONBLE. SIR JOHN P. GRANT,

*President of the Fever Hospital and Municipal Improvement Committee.*

SIR,

I have the honour to acknowledge the receipt of your communication, dated the 30th August last, requesting me, as President of the Fever Hospital and Municipal Improvement Committee, to prepare for the consideration of the said Committee, plans and estimates of Hospitals for the reception respectively of 20, 30, and 250 patients.

2. Accompanying I beg to submit the plans and estimates called for. From an inspection of the latter, you will perceive that the probable cost of each description of Hospital is as follows, viz.

| | Co's. Rs. | a. | p. |
|---|---|---|---|
| For 20 patients, .. .. .. .. .. | 37,021 | 8 | 1 |
| For 30 ditto, .. .. .. .. .. | 42,376 | 1 | 2 |
| For 120 ditto, .. .. .. .. .. | 97,778 | 2 | 6 |

3. Consequently, to construct, according to the plans submitted, eleven Hospitals for 20 patients, and one for 30 (or for 250 in all) would involve an expenditure of Company's Rupees 4,49,612 : 10 : 1 ; and to construct two Hospitals for 120 patients each (or 240 in all) would involve an expenditure of Co's. Rs. 1,95,556 : 5 : 0.

4. Supposing, then, that similar accommodation is provided in either description of Hospital, as nearly as their difference of size will admit of, it would appear from the above statement, that an equal number of sick could be located in two large Hospitals at less than one half of the expense that they could be in twelve small ones.

5. In preparing the plans I have been guided by the suggestions, as well as my experience could assist me, contained in the second paragraph of your letter under reply, and which I beg your permission to quote—viz. "That the first object to be attended to "is, that the plan should be as perfect for the cure of the sick, as can be devised in the present "state of knowledge on the subject. The second, that the structure be such, and of such "materials, as to ensure the greatest durability, and the least frequent necessity for "repairs that the country and climate would admit. And the third, that the greatest "economy be observed which is consistent with the accomplishment of these objects, "and with the bestowing upon the exterior of the building the pleasing proportions "and classical chastity which ought to mark a public building in this Capital, erected "not for ornament only, but for a purpose of great and grave utility."

6. I have also had the benefit of frequent communication and consultation with Mr. Martin whilst preparing the plans, and whose full approval of the details I have his permission to acknowledge.

7. Moreover, in the general arrangement of the designs, I have not failed to pursue, as far as circumstances would admit, a precedent of a building already in existence, originally intended for an Hospital, but now appropriated as the Sudder Dewanny and Nizamut Adawlut Court House, and to adapt it for which latter purpose it has undergone interior alteration.

8. This building, which I look upon as nearly perfect as an Hospital, was, I believe, designed, in all its material points, by the late Dr. Burke, Inspector of Hospitals in this country; a military Physician of great eminence, and one whose pursuits had enabled him to obtain an intimate knowledge of Hospitals in various parts of the world. I could not therefore, I imagine, have followed a better example in endeavouring to gain the first object of inquiry.

9. But I have deviated in some degree from the general design, above mentioned, in breaking up the interior accommodation into a greater number of Wards, which I have deemed advisable for the better classification of the sick—for the convenience of the different sexes, if desired—and also, because I believe it is generally admitted amongst Medical men, that in a small Ward (comparatively speaking) the space for each individual being the same as in a large one, a patient has a better chance of recovery than when otherwise accommodated.

10. The second object—the greatest durability of the structure—is provided for in the estimates. I proceed therefore to offer some remarks on the third and last object.

11. First, With respect to the classical chastity, &c. of the designs, the plans will best speak for themselves; all I have endeavoured to ensure, is extreme simplicity—any profusion of ornament being, I think, out of character in buildings of this nature; and,

12. Second, With respect to the greatest economy to be observed, consistent with the accomplishment of the various objects desired. It will be obvious that these cannot be attained at any small cost. Height must be given to the ground floor, and ample space must be allowed in the interior of any place that is destined for the accommodation of sick persons.

13. In the plans submitted, the basement floor is raised eight feet—an elevation not by any means too high, in the opinion of Medical men. The accommodation for the sick is in the centre, surrounded with an enclosed verandah and an open one beyond, either suitable at different stages of disease and times of day for convalescents: and the baths and other conveniences are all within the building, with the exception of the cooking room and the dead house and dissecting room, which should be in distinct and separate buildings.

14. To attain all these different objects, and to provide for the resident Apothecary in a small Hospital, is quite out of the question at any moderate cost. I shall therefore in the further consideration of this point omit the smaller Hospitals altogether, as, unless made on quite a different, and, in my opinion, less suitable plan, they cannot bear comparison with the larger ones in the point of economy, however desirable they may be in all other respects.

15. To come therefore to the immediate question—The economy of the larger Hospital. In this building it is intended that 120 sick should be suitably provided for at an expense something under one lac of Rupees. This is doubtless a large sum of money, but to shew that it is comparatively smaller than what the Government have once already sanctioned, I may mention, that the building to which I have before alluded in the 7th paragraph of this letter, and which was designed for 160 patients only, cost in its erection Co's. Rs. 2,00,000 and upwards.

16. By this statement, and I know of no better means of enabling the Committee to judge of the economy of the design under consideration, it will appear that the relative cost of the proposed and of the actual structure, when brought into comparison with each other, regard being of course had to the numbers of sick to be accommodated in either, will be as 10 to 15 in favour of the present plan.

17. To these remarks I may add, generally, that if the interior accommodation of the Hospitals is considered too ample, by placing two more cots in each Ward, and by occupying the enclosed verandahs with the sick, there may be placed

| | |
|---|---|
| In the Hospital for 20 patients. . .. .. | 50 |
| In that for 30 patients, .. .. .. | 70 |
| In that for 120 patients. .. .. .. | 200 |

and even when thus occupied, though I do not recommend such a measure, they would be preferable as Hospitals, to any buildings that I am aware of used for like purposes in this country.

18. To conclude—in all Hospitals economy of life ought to be the first consideration, and economy of expenditure should be confined alone to seeing the details properly executed after the plan is approved. If, and the supposition is not unreasonable, the life of one man more in every hundred is saved, solely from its superior adaptation in a good Hospital than in a bad one, what sum of money that a State can afford to give can be put in opposition, when such is the result to be obtained by increased expenditure?

I have the honour to be,

Sir,

Your most obedient servant,

W. R. FITZGERALD,

*Civil Architect.*

FORT WILLIAM,
*8th December*, 1838.

## No. 62. (A)

*Estimate of the probable expense of constructing an Hospital for 120 patients, as per accompanying plan—Fort William, 8th Dec. 1838.*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Solid feet of Masonry for Foundation, .. .. .. | | 22,201 | 0 | | | | |
| | Do. Do. Plinth, .. .. .. .. | | 167,518 | 0 | | | | |
| | Do. Do. Superstructure, .. .. | | 153,955 | 0 | | | | |
| | Do. Platforms, Parapet Wall, Staircase, &c .. .. | | 19,245 | 6 | | | | |
| | | | 362,919 | 6 | | | | |
| | Less for openings, .. .. .. .. | | 66,678 | 0 | | | | |
| | | Feet, | 296,241 | 6 | | | | |
| 96,241-6 | Solid feet of Masonry, 15/ per 100 feet .. | | 44,436 | 3 | 7 | | | |
| 39,765-6 | Square feet of Roofing, 16/ per ditto .. .. | | 6,362 | 7 | 8 | | | |
| 990 | Running feet of Pillar, 2/8 per foot .. | | 2,475 | 0 | 0 | | | |
| 1,250 | Do. feet of Cornice, 1/ per foot .. .. .. | | 1,250 | 0 | 0 | | | |
| 33,173 | Supl. feet of Chunar Stones Paving, .. .. .. | 35 per 100 feet | 11,610 | 8 | 10 | | | |
| | | | | | | 66,134 | 4 | 1 |
| | ***Painting.*** | | | | | | | |
| 15,000 | Supl feet of Green Painting, | 2/8 per 100 feet | 375 | 0 | 0 | | | |
| 41,709 | Do. feet of White ditto, .. | 2/2 ditto, | 950 | 0 | 8 | | | |
| | | | | | | 1,325 | 0 | 8 |
| | ***Wood Work.*** | | | | | | | |
| 554 | Saul Architrave, 18×12 inches, | 2 4 0 foot | 1,246 | 8 | 0 | | | |
| 138 | Do. Beams, 21½×10½×7½=2967 ft. | 0 13 0 do. | 2,410 | 11 | 0 | | | |
| 72 | Do. do 17 × 9¼×6½=1224 ft. | 0 10 0 do. | 765 | 0 | 0 | | | |
| 72 | Do. do 14½× 8½×6 =1044 ft. | 0 8 3 do. | 538 | 5 | 0 | | | |
| 200 | Do. do. 15½× 8¼×6 =3100 ft. | 0 8 3 do. | 1,598 | 7 | 0 | | | |
| 54 | Do. do. 13 × 7¾×5¼= 702 ft. | 0 7 0 do. | 307 | 2 | 0 | | | |
| 48 | Do. do. 12 × 7¾×5½ = 576 ft. | 0 7 0 do. | 252 | 0 | 0 | | | |
| 19 | Do. do 23 × 11½×8 = 437 ft. | 0 15 3 do. | 416 | 8 | 3 | | | |
| 29,494 | Do. Burgahs 3×3 inches, .. .. | 7/ per 100 do. | 2,064 | 9 | 3 | | | |
| 6,923-8 | Teak Venetian and Pannel doors, | 1/ per foot | 6,923 | 10 | 8 | | | |
| 4,205-6 | Sash frames, including Glass, .. .. | /10 do. | 2,628 | 7 | 0 | | | |
| 1,246 | Teak Railings, .. .. .. .. . | /4 do. | 311 | 8 | 0 | | | |
| 160 | Chowkets of Sizes, .. .. .. .. | | 1,280 | 0 | 0 | | | |
| 52 | Fan lights, .. .. .. .. .. .. .. | | 520 | 0 | 0 | | | |
| | | | | | | 21,262 | 12 | 2 |
| | | | | | | 88,722 | 0 | 11 |
| | Contingent at 5 per cent. .. .. .. .. .. | | | | | 4,656 | 1 | 7 |
| | | Total for Hospital, .. | | | | 93,378 | 2 | 6 |
| | Cost of Out-Offices, ... .. .. .. .. .. | | | | | 4,400 | 0 | 0 |
| | | Grand Total Co's. Rs. .. | | | | 97,778 | 2 | 6 |

W. R. FITZGERALD,
*Civil Architect.*

# No. 62. (B)

*Estimate of the probable expense of constructing an Hospital for 30 patients, as per accompanying plan—Fort William, December 8, 1838.*

| | | |
|---|---|---|
| Solid feet of Masonry for Foundation, | .. .. .. | 13,617 |
| Do. Do. Plinth, | .. .. .. .. .. | 80,268 |
| Do. Do. Superstructure, | .. .. | 46,236 |
| Do. Platform, Parapet Wall, Staircase, &c. | .. | 11,204 |
| | | 151,325 |
| Less for Openings, | .. .. .. .. .. .. .. .. .. | 9,380 |
| | Feet, | 141,945 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 141,945 | Solid feet of Masonry, | 15/ per 100 feet .. .. | 21,291 | 12 | 0 | | | |
| 1376 | Square feet of Roofing, | 16/ per ditto .. .. | 2,197 | 12 | 2 | | | |
| 512 | Running feet of Pillars, | 2/8 per foot . .. .. | 1,280 | 0 | 0 | | | |
| 504 | Ditto feet of Cornice, | 1/ per foot .. .. .. | 504 | 0 | 0 | | | |
| 10,440 | Supl. feet of Chunar Stones Paving, .. .. .. .. | 35/ per 100 feet | 3,654 | 0 | 0 | | | |
| | | | | | | 28,927 | 8 | 2 |
| | *Painting.* | | | | | | | |
| 7,638 | Supl. feet of Green Painting, | 2/8 per 100 feet | 190 | 15 | 2 | | | |
| 21,109-10 | Do. feet of White Ditto, .. | 2/2 ditto | 448 | 9 | 3 | | | |
| | | | | | | 639 | 8 | 5 |
| | *Wood Work.* | | | | | | | |
| 280 | Saul Architrave 18×12 inches | 2 4 0 per foot | 630 | 0 | 0 | | | |
| 4 | Saul Beams 23×14×10 = 92 ft. | 1 7 6 do. | 135 | 2 | 0 | | | |
| 39 | Do. Do. 21×10½×7½ = 819 ft. | 0 13 0 do. | 665 | 7 | 0 | | | |
| 74 | Do. Do. 15×8½×6 = 1110 ft. | 0 8 3 do. | 572 | 5 | 6 | | | |
| 8 | Do. Do. 13×8½×6 = 104 ft. | 0 8 3 do. | 53 | 10 | 0 | | | |
| 8 | Do. Do. 11×8½×6 = 88 ft. | 0 8 3 do. | 45 | 6 | 0 | | | |
| 8 | Do. Do. 9×8½×6 = 72 ft. | 0 8 3 do. | 37 | 2 | 0 | | | |
| 85 | Do. Do. 13×7¾×5½ = 1105 ft. | 0 7 0 do. | 483 | 7 | 0 | | | |
| 6 | Do. Do. 11½×7×5 = 69 ft. | 0 6 0 do. | 51 | 12 | 0 | | | |
| 19 | Do. Do. 24×12×8½ = 456 ft. | 1 1 0 do. | 484 | 8 | 0 | | | |
| 11,203 | Saul Burgahs, 3×3 inches ... | 7/ per 100 do. | 714 | 3 | 3 | | | |
| 2,687 | Teak Venetian and Pannel doors, | 1/ per foot | 2,687 | 0 | 0 | | | |
| 1,738-9 | Sash frames, including Glass ... | /10 do. | 1,068 | 11 | 6 | | | |
| 474 | Teak Rails, ... .. ... ... ... | /4 do. | 118 | 8 | 0 | | | |
| 68 | Door frames of sizes, .. .. ... ... .. ... | | 544 | 0 | 0 | | | |
| | | | | | | 8,291 | 2 | 3 |
| | | | | | | 37,858 | 2 | 10 |
| | Contingent at 5 per cent, ... .. .. .. ... ... | | | | | 2,017 | 14 | 4 |
| | | Total for Hospital .. | | | | 39,876 | 1 | 2 |
| | Cost of Out-Offices ... .. .. .. .. ... .. | | | | | 2,500 | 0 | 0 |
| | | Grand Total Co's. Rs. | | | | 42,376 | 1 | 2 |

W. R. FITZGERALD,
*Civil Architect.*

# No. 62. (c)

*Estimate of the probable expense of constructing an Hospital for 20 patients, as per accompanying plan—Fort William, December 8, 1838.*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Solid feet of Masonry for Foundation, .. .. | 11,905 | 0 | | | | |
| | Do. Do. for Plinth .. .. .. | 90,868 | 0 | | | | |
| | Do. Do. for Superstructure, .. | 42,313 | 0 | | | | |
| | Do. Platform, Parapet Wall, Staircase, &c. .. | 9,158 | 3 | | | | |
| | | 1,54,244 | 3 | | | | |
| | Less for Openings .. .. .. .. .. | 30,445 | 6 | | | | |
| | Feet, | 1,23,798 | 9 | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 123,798-9 | Solid feet of Masonry, 15/ per 100 feet .. .. | 18,569 | 13 | 0 | | | |
| 11,467 | Square feet of Roofing, 16/ per ditto .. .. | 1,834 | 12 | 2 | | | |
| 448 | Running feet of Pillars, 2/8 per foot .. .. | 1,120 | 0 | 0 | | | |
| 470 | Running feet of Cornice, 1/ per ditto .. .. | 470 | 0 | 0 | | | |
| 9,460 | Supl. feet of Chunar Stones, 35/ per 100 feet .. | 3,311 | 0 | 0 | | | |
| | | | | | 25,305 | 9 | 2 |
| | *Painting.* | | | | | | |
| 8,000 | Supl. feet of Green Painting, 2/8 per 100 feet .. | 200 | 0 | 0 | | | |
| 13,000 | Supl. feet of White ditto, 2/2 per ditto .. .. | 276 | 4 | 0 | | | |
| | | | | | 476 | 4 | 0 |
| | *Wood Work.* | | | | | | |
| 228 | Saul Architrave 18×12 inches 2 4 0 foot | 513 | 0 | 0 | | | |
| 29 | Saul Beams 21×10½×7½=609 ft. 0 13 0 do. | 494 | 13 | 0 | | | |
| 62 | Ditto do. 15×8½×6=930 ft. 0 8 3 do. | 479 | 8 | 6 | | | |
| 8 | Ditto do. 9×8½×6= 72 ft. 0 8 3 do. | 37 | 2 | 0 | | | |
| 8 | Ditto do. 7×8½×6= 56 ft. 0 8 3 do. | 28 | 14 | 0 | | | |
| 4 | Ditto do. 22×10×8= 88 ft. 0 13 6 do. | 74 | 4 | 0 | | | |
| 73 | Ditto do. 13×7¾×5½=919 ft. 0 7 0 do. | 415 | 3 | 0 | | | |
| 12 | Ditto do. 23×11½×8=276 ft. 0 15 3 do. | 263 | 1 | 0 | | | |
| 9,081 | Ditto Burgahs 3×3 inches. .. 7/ per 100 do. | 635 | 10 | 8 | | | |
| 295 | Feet Teak Rails, .. /4 per foot | 73 | 12 | 0 | | | |
| 2,527-10½ | Ditto do. Pannel and Ven. Doors, 1/ do. | 2,527 | 14 | 8 | | | |
| 1,538-6¼ | Ditto Sash frames including Glass, /10 do. | 961 | 9 | 3 | | | |
| 56 | Chowkets large, .. .. .. .. | 448 | 0 | 0 | | | |
| 6 | Ditto small, .. .. .. .. | 24 | 0 | 0 | | | |
| | | | | | 6,976 | 12 | 1 |
| | | | | | 32,758 | 9 | 3 |
| | Contingent at 5 per cent .. .. .. | | | | 1,762 | 14 | 10 |
| | Total for Hospital. .. .. | | | | 34,521 | 8 | 1 |
| | Cost of Out-Offices . .. .. ... .. .. | | | | 2,500 | 0 | 0 |
| | Grand Total Co's. Rs. | | | | 37,021 | 8 | 1 |

W. R. FITZGERALD,
*Civil Architect*

## No. 63.

*Additional Questions put to*

**DR. BAIN**

1. Have you the means, from Records kept in the Hospital, or from the daily Dieting Rolls, or otherwise, of stating the average number of In-patients *daily* in the Police Hospital during each of the five years ending 1837; and if so, will you be so good as to state it?

2. If you have not the means of stating with accuracy the average daily number for these years, have you any means of stating it with a probable approximation to the truth; and if so will you be so good as to state it?

## No. 63. (A)

To THE HONBLE. SIR J. P. GRANT,

*Chairman of the Fever Hospital and Municipal Improvement Committee.*

SIR, *Calcutta, 12th December, 1838*

In reply to your application of the 16th ultimo, I herewith beg to forward you a statement of the total number of patients in each year, from 1832 to the end of 1837, also the average number of In-patients *daily* in the Police Hospital during each of the six years above noticed. The Report has been drawn up from the Diet Rolls kept by the Native Doctor up to the end of the year 1835, and from that time to the end of 1837 by the European Apothecary of the Hospital.

I have the honour to be, Sir,

Your most obedient and humble servant,

R. H. BAIN, *Police Surgeon*

*Abstract, shewing the total number of Patients yearly in the Police Hospital, from 1st January, 1832, to 31st December, 1837.*

| | | | |
|---|---|---|---|
| For the year | | 1832, | 11,962 |
| Do. | Do. | 1833, | 20,804 |
| Do. | Do. | 1834, | 33,882 |
| Do. | Do. | 1835, | 33,926 |
| Do. | Do. | 1836, | 26,136 |
| Do. | Do. | 1837, | 37,869 |
| | | Grand total for six years..... | 1,64,579 |

*Average Number of In-patients daily in the Police Hospital during each of the six years, ending 1837.*

| | | | |
|---|---|---|---|
| Average daily for the year | | 1832, | $35 \frac{152}{366}$ |
| Do. | Do. | 1833, | $56 \frac{364}{365}$ |
| Do | Do. | 1834, | $93 \frac{34}{365}$ |
| Do. | Do | 1835, | $93 \frac{78}{365}$ |
| Do. | Do. | 1836, | $71 \frac{150}{366}$ |
| Do | Do. | 1837, | $103 \frac{271}{365}$ |

R. H. BAIN, M. D *Police Surgeon.*

*Calcutta, 10th December,* 1838.

## No. 64.

No. 299.

To THE HONBLE. SIR J. P GRANT

*&c. &c. &c.*

*Calcutta.*

SIR,

Agreeably to the request contained in your letter of the 16th ultimo, I beg to enclose the Returns called for by the Fever Hospital and Municipal Improvement Committee

I have the honour to be,

Sir

Your most obedient servant

J GRANT *Surgeon,*

*Apothecary E. I. C*

E. I. C DISPENSARY,

*19th December,* 1838.

## No. 64. (A)

*Return of expense of Medicines, &c supplied from the Government Medical Stores for the use of the Calcutta General Hospital.—viz*

| | | £. | s. | d | |
|---|---|---|---|---|---|
| Calcutta General Hospital, | 1833-34. | 403 | 14 | 9½ | |
| Calcutta General Hospital, | 1834-35. | 362 | 10 | 11½ | |
| Calcutta General Hospital, | 1835-36. | 169 | 12 | 7¾ | |
| Calcutta General Hospital, | 1836-37. | 122 | 12 | 5½ | |
| Calcutta General Hospital, | 1837-38. | 129 | 4 | 0¼ | |
| | | | | | £. 1187 14 10½ |

J GRANT, *Surgeon,*

*Apothecary E. I. C*

## No. 64. (B)

*Return of expense of Medicines, &c. supplied from the Government Medical Stores for the use of the Calcutta Native Hospital and its dependent Dispensaries.—viz.*

| | | £. | s. | d. | £. | s. | d. |
|---|---|---|---|---|---|---|---|
| | 1833-34. | | | | | | |
| Calcutta Native Hospital, | .. .. .. .. .. | 179 | 7 | 4¼ | | | |
| Gurranhattah Dispensary, | .. .. .. .. .. | 157 | 10 | 11 | | | |
| Cullingah Dispensary, | .. .. .. .. .. | 214 | 2 | 2¼ | | | |
| | | | | | 551 | 0 | 6 |
| | 1834-35. | | | | | | |
| Calcutta Native Hospital, | .. .. .. .. .. | 233 | 7 | 4¼ | | | |
| Gurranhattah Dispensary, | .. .. .. .. .. | 176 | 17 | 1¾ | | | |
| Cullingah Dispensary, | .. .. .. .. .. | 246 | 0 | 5¼ | | | |
| | | | | | 656 | 4 | 11¼ |
| | 1835-36. | | | | | | |
| Calcutta Native Hospital, | .. .. .. .. .. | 170 | 17 | 2 | | | |
| Gurranhattah Dispensary, | .. .. .. .. .. | 124 | 5 | 6¼ | | | |
| Cullingah Dispensary, | .. .. .. .. .. | 137 | 9 | 11¾ | | | |
| | | | | | 432 | 12 | 8¼ |
| | 1836-37. | | | | | | |
| Calcutta Native Hospital, | .. .. .. .. .. | 160 | 15 | 0½ | | | |
| Gurranhattah Dispensary, | .. .. .. .. .. | 133 | 11 | 7¼ | | | |
| Cullingah Dispensary, | .. .. .. .. .. | 116 | 9 | 0¼ | | | |
| | | | | | 410 | 15 | 8¼ |
| | 1837-38. | | | | | | |
| Calcutta Native Hospital, | .. .. .. .. .. | 209 | 1 | 3¼ | | | |
| Gurranhattah Dispensary, | .. .. .. .. .. | 129 | 16 | 9¼ | | | |
| Cullingah Dispensary, | .. .. .. .. .. | 128 | 10 | 3¼ | | | |
| | | | | | 467 | 8 | 5 |
| | | | | | £ 2518 | 2 | 3¼ |

J. GRANT, *Surgeon,*

*Apothecary E. I. C.*

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## No. 64. (C)

*Return of expense of Medicines, &c. supplied from the Government Medical Stores for the use of the Calcutta Police Hospital.—viz.*

| | | | | £. | s. | d. | | | |
|---|---|---|---|---|---|---|---|---|---|
| Calcutta Police Hospital, | .. .. | 1833-34. | .. .. | 14 | 6 | 9¾ | | | |
| Calcutta Police Hospital, | .. .. | 1834-35. | .. .. | 7 | 4 | 2¼ | | | |
| Calcutta Police Hospital, | .. .. | 1835-36. | .. .. | 39 | 16 | 4¾ | | | |
| Calcutta Police Hospital, | .. .. | 1836-37. | .. .. | 58 | 8 | 1½ | | | |
| Calcutta Police Hospital, | .. .. | 1837-38. | .. .. | 62 | 4 | 11½ | | | |
| | | | | | | | £ 182 | 0 | 5¾ |

J. GRANT, *Surgeon.*

*Apothecary E. I. C.*

# No. 65.

*Queries by the Committee on the Fever Hospital and Municipal Improvements, to which Answers are requested from*

CHARLES C. EGERTON, ESQ.,

*Superintendent of the Eye Infirmary.*

The Governour General in his capacity of Governour of Bengal, has intimated to the Committee his desire, that in the report they are to make upon the various subjects referred to them, they should " enter into an examination and review of the funds already " appropriated to charities of a Medical description—of the manner in which they are " applied—of the modes which may be suggested for their increase, or improved applica- " tion—and of the relative value of these existing Institutions."

In order to enable them to report as required upon the Eye Infirmary—forming one of these institutions—they request from Mr. Egerton answers to the following queries.

*Q.* 1. When was the Eye Infirmary established, and at what expense? What was the number of patients it was originally designed to receive? Was the building erected or purchased, and at what cost? Or is it hired, and at what rent?

*A.* The Eye Infirmary was first instituted in compliance with orders from the Honourable Court of Directors, in November, 1824—vide General Order 344, of 1824. A small house was taken for the purpose at Bhowanypore by Government, at a rent of Sa. Rs. 200 per mensem. The number admitted during the first year amounted to 95.

*Q.* 2. Has it been since enlarged; and if so, for the reception of what number of additional patients? And at what expense?

*A.* About nine years ago the present house, No. 1, Wood Street, Chowringhee, was engaged for the purpose of an Eye Infirmary by Government, at a rent of 250 Sa Rs. per mensem, the former house having been found too small and inconveniently situated.

*Q.* 3. Do the patients, or any of them, live and sleep in the Infirmary? What number of such patients is it now capable of receiving? And what has been the total annual amount of patients received for the five years ending 1837; distinguishing the description of complaint, the numbers discharged cured, the numbers discharged incurable, and the numbers remaining at the end of each year? What has been the average daily number of patients residing in the Infirmary during the above-mentioned five years?

*A.* Patients reside in the Infirmary in numbers varying from 84 to 90. There are 63 beds in the male and 30 in the female Ward.

For the information here required, I beg to refer the Committee to the annual* Returns already sent for their information.

*Q.* 4. Does it administer relief to Out-patients, and in what cases? And what has been the number of Out-patients, and labouring under what description of complaint to whom it has administered relief annually during the said five years? What has been the number of Out-patients cured? What has been the number declared incurable? And what has been the number who have ceased to attend, the result of whose cases has been unknown, during each of the said five years?

*A.* Out-patients attend, each man, once every three days for his medicine—they may come when they like, or take away with them three days medicine.

There are very few return to say they are cured; but I have no doubt that most of them are so, or materially relieved; but on account of the uncertainty, I have never stated the results. I rarely operate upon Out-patients, fearing that from want of proper attention, they might suffer from inflammation.

* These Returns will be found to follow these Queries and Answers.

*Q.* 5. What has been the average length of time during which patients have continued under treatment? And what has been the average daily number of patients in the Infirmary?

*A.* About six weeks. About 80.

*Q.* 6. What is its present total establishment of Medical and other attendants? What are the allowances of each, and their total amount per month? And what, exclusive of these, is the total monthly expense of the Infirmary, distinguishing diet and clothing and repairs from medicines, and by whom defrayed?

*A.* Information on these several points has already been transmitted in the Returns* sent in. The only expense which I have omitted is my own personal pay; which I should equally have drawn as Surgeon to the Military Upper Orphan Schools, or as Professor of Surgery at the Native Medical College. The whole expense is defrayed by Government.

In conclusion, I beg to say, that though at first, in 1825, I found the patients very reluctant to be inmates of the Infirmary, they are now very ready to come, and that their numbers have increased very steadily every year—with the exception of one, when owing to a new scheme for dieting the patients being adopted, they nearly all fled.

The number admitted in 1825 I have stated to be 95—the number admitted during the year 1838 is 661—the Out-patients for 1838 amount to 1473.

I have likewise to mention that there is an Eye Infirmary in Calcutta, under the charge of Mr. Assistant Surgeon Raleigh, to whom I beg to refer the Committee for any information they may require.

CHARLES C. EGERTON,
*Superintendent of the Eye Infirmary.*

EYE INFIRMARY,
*16th January*, 1839.

## No. 65. (A)

*List of the Native Establishment of the Eye Infirmary.*

| Names. | Rank. | | Salary. | | |
|---|---|---|---|---|---|
| Holodhur Chukrobutty | English Writer | Co's. Rs. | 25 | 0 | 0 |
| Toofanee, | Native Doctor, | ,, | 15 | 0 | 0 |
| Tarachand Doss, | Compounder, | Sa. Rs. | 12 | 0 | 0 |
| Aptabuddee, | Dresser, | ,, | 6 | 0 | 0 |
| Noorbux, | Mussulman Cook, | ,, | 5 | 0 | 0 |
| Boolakee, | Mussulman Bhistee, | ,, | 5 | 0 | 0 |
| Khyrun, | Ayah, | ,, | 5 | 0 | 0 |
| Jeetoo Roy, | Hindoo Cook, | ,, | 6 | 0 | 0 |
| Gocool Doss, | Hindoo Bhistee, | ,, | 5 | 0 | 0 |
| Rosun, | Leechman, | ,, | 6 | 0 | 0 |
| Sookee, | Mehatur, | ,, | 4 | 0 | 0 |
| Subrun, | Mehatur, | ,, | 4 | 0 | 0 |
| Sheikh Bengally, | Dhoobee | Co's. Rs. | 6 | 0 | 0 |
| Kumuldharee, | Goorgah | ,, | 4 | 0 | 0 |

(*Signed*) CHARLES C. EGERTON,
*Superintendent of the Eye Infirmary.*

*12th January*, 1839.

* These Returns will be found to follow these Queries and Answers.

## No. 65. (B)

*Abstract of Monthly Supplies to the Eye Infirmary, during the year 1833.*

| | Bazar Medicine and Necessaries. | | | Allowance of Patients. | | | Establishment. | | | Total. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [Rs.] | [As.] | [P.] | [Rs.] | [As.] | [P.] | [Rs.] | [As.] | [P.] | [Rs.] | [As.] | [P.] |
| For January, 1833. | 34 | 6 | 3½ | 200 | 14 | 0 | 58 | 0 | 0 | 293 | 4 | 3½ |
| ,, February, ,, | 34 | 7 | 3 | 191 | 10 | 0 | 58 | 0 | 0 | 284 | 1 | 3 |
| ,, March, ,, | 42 | 3 | 9 | 251 | 12 | 0 | 58 | 0 | 0 | 351 | 15 | 9 |
| ,, April, ,, | 42 | 11 | 8 | 221 | 10 | 0 | 58 | 0 | 0 | 322 | 5 | 8 |
| ,, May, ,, | 35 | 14 | 4 | 246 | 4 | 0 | 62 | 12 | 7 | 344 | 14 | 11 |
| ,, June, ,, | 35 | 9 | 2 | 259 | 2 | 0 | 67 | 9 | 1 | 362 | 4 | 3 |
| ,, July, ,, | 35 | 8 | 3½ | 264 | 12 | 0 | 67 | 9 | 1 | 367 | 13 | 4½ |
| ,, August, ,, | 41 | 6 | 5½ | 227 | 12 | 0 | 67 | 9 | 1 | 336 | 11 | 6½ |
| ,, September, ,, | 39 | 3 | 9½ | 221 | 10 | 0 | 67 | 9 | 1 | 328 | 6 | 10½ |
| ,, October, ,, | 44 | 12 | 10 | 214 | 8 | 0 | 67 | 9 | 1 | 326 | 13 | 11 |
| ,, November, ,, | 42 | 11 | 2½ | 208 | 4 | 0 | 67 | 9 | 1 | 318 | 8 | 3½ |
| ,, December ,, | 33 | 12 | 7 | 185 | 10 | 0 | 67 | 9 | 1 | 286 | 15 | 8 |
| Total,.... | 462 | 11 | 7½ | 2,693 | 12 | 0 | 767 | 12 | 2 | 3,924 | 3 | 9½ |

FORT WILLIAM, COMMSIT. OFFICE, (*Signed*) S. HAWKINS,
*20th June* 1834. *Depy. Asst. Comy. Genl.*

(True Copy,) CHARLES C EGERTON.
*Superintendent of the Eye Infirmary.*

## No. 65. (C)

*Abstract of Monthly Supplies to the Eye Infirmary, during the year 1834.*

| | Bazar Medicine and Necessaries. | | | Allowance of Patients. | | | Establishment. | | | Total. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [Rs.] | [As.] | [P.] | [Rs.] | [As.] | [P.] | [Rs.] | [As.] | [P.] | [Rs.] | [As.] | [P.] |
| For January, 1834. | 35 | 3 | 9 | 214 | 4 | 0 | 81 | 14 | 9 | 331 | 6 | 6 |
| ,, February, ,, | 38 | 11 | 3½ | 203 | 4 | 0 | 81 | 14 | 9 | 323 | 14 | 0½ |
| ,, March, ,, | 46 | 11 | 6 | 225 | 2 | 0 | 81 | 14 | 9 | 353 | 12 | 3 |
| ,, April, ,, | 47 | 2 | 1½ | 259 | 10 | 0 | 81 | 14 | 9 | 388 | 10 | 10½ |
| ,, May, ,, | 46 | 2 | 6 | 268 | 0 | 0 | 81 | 14 | 9 | 396 | 1 | 3 |
| ,, June, ,, | 46 | 0 | 11 | 257 | 6 | 0 | 81 | 14 | 9 | 385 | 5 | 8 |
| ,, July, ,, | 291 | 12 | 5 | 265 | 6 | 0 | 81 | 14 | 9 | 639 | 1 | 2 |
| ,, August, ,, | 51 | 5 | 11½ | 230 | 4 | 0 | 81 | 14 | 9 | 363 | 8 | 8½ |
| ,, September, ,, | 47 | 4 | 7 | 261 | 10 | 0 | 81 | 14 | 9 | 390 | 13 | 4 |
| ,, October, ,, | 52 | 5 | 11 | 224 | 2 | 0 | 213 | 13 | 11 | 490 | 5 | 10 |
| ,, November, ,, | 185 | 9 | 2 | 271 | 10 | 0 | 205 | 13 | 6 | 563 | 0 | 8 |
| ,, December, ,, | 48 | 0 | 2 | 251 | 4 | 0 | 205 | 13 | 6 | 405 | 1 | 8 |
| Total,.... | 936 | 6 | 3½ | 2,931 | 14 | 0 | 1,162 | 13 | 8 | 5,031 | 1 | 11½ |

FORT WILLIAM, COMMIST. OFFICE, (*Signed*) S. HAWKINS,
*23d January*, 1835. *Depy. Asst. Comy. Genl.*

(True Copy) CHARLES C. EGERTON,
*Superintendent of the Eye Infirmary.*

## No. 65. (D)

*Abstract of Monthly Supplies to the Eye Infirmary, during the year 1835.*

| | Bazar Medicine and Necessaries. | | | Allowance of Patients. | | | Establishment. | | | Total. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| For January, 1835. | 43 | 3 | 7 | 254 | 8 | 0 | 105 | 13 | 6 | 403 | 9 | 1 |
| ,, February, ,, | 42 | 11 | 0 | 207 | 6 | 0 | 105 | 13 | 6 | 355 | 14 | 6 |
| ,, March, ,, | 56 | 11 | 4 | 225 | 2 | 0 | 105 | 13 | 6 | 383 | 10 | 10 |
| ,, April, ,, | 54 | 3 | 7 | 206 | 4 | 0 | 105 | 13 | 6 | 366 | 5 | 1 |
| ,, May, ,, | 37 | 5 | 2 | 238 | 14 | 0 | 105 | 13 | 6 | 382 | 0 | 8 |
| ,, June, ,, | 43 | 12 | 2 | 256 | 10 | 0 | 105 | 13 | 6 | 406 | 3 | 8 |
| ,, July, ,, | 53 | 14 | 8 | 276 | 8 | 0 | 105 | 13 | 6 | 436 | 4 | 2 |
| ,, August, ,, | 54 | 6 | 4 | 266 | 14 | 0 | 105 | 13 | 6 | 427 | 1 | 10 |
| ,, September, ,, | 42 | 3 | 9 | 256 | 0 | 0 | 105 | 13 | 6 | 404 | 1 | 3 |
| ,, October, ,, | 45 | 11 | 11½ | 231 | 0 | 0 | 105 | 13 | 6 | 382 | 9 | 5½ |
| ,, November, ,, | 44 | 3 | 0 | 245 | 10 | 0 | 105 | 13 | 6 | 395 | 10 | 6 |
| ,, December, ,, | 172 | 6 | 9 | 249 | 13 | 10 | 105 | 13 | 6 | 532 | 13 | 11 |
| Total, .. | 690 | 13 | 3½ | 2,914 | 9 | 10 | 1,271 | 13 | 10 | 4,880 | 4 | 11½ |

FORT WILLIAM, COMMIST. OFFICE,
*2d March*, 1836.

(*Signed*) S. HAWKINS,
*Depy. Asst. Comy. Genl.*

(True Copy) CHARLES C. EGERTON,
*Superintendent of the Eye Infirmary.*

## No. 65. (E).

*Abstract of Monthly Supplies to the Eye Infirmary, during the year 1836.*

| | Bazar Medicine and Necessaries. | | | Allowance of Patients. | | | Establishment. | | | Total. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| For January, 1836. | 35 | 11 | 3 | 205 | 4 | 0 | 110 | 9 | 4 | 351 | 8 | 7 |
| ,, February, ,, | 39 | 8 | 7 | 233 | 6 | 0 | 110 | 9 | 4 | 383 | 7 | 11 |
| ,, March, ,, | 40 | 11 | 6 | 217 | 8 | 0 | 110 | 9 | 4 | 368 | 12 | 10 |
| ,, April, ,, | 49 | 12 | 2¼ | 234 | 6 | 0 | 110 | 9 | 4 | 385 | 11 | 6¼ |
| ,, May ,, | 15 | 4 | 1¼ | 239 | 12 | 0 | 110 | 9 | 4 | 365 | 9 | 5¼ |
| ,, June, ,, | 75 | 5 | 1 | 239 | 8 | 0 | 110 | 9 | 4 | 428 | 6 | 5 |
| ,, July, ,, | 49 | 9 | 3 | 261 | 14 | 0 | 110 | 9 | 4 | 422 | 0 | 7 |
| ,, August, ,, | 55 | 4 | 8¼ | 228 | 10 | 0 | 110 | 9 | 4 | 394 | 8 | 0¼ |
| ,, September, ,, | 44 | 12 | 6¼ | 227 | 14 | 0 | 110 | 9 | 4 | 383 | 3 | 10¼ |
| ,, October, ,, | 47 | 6 | 11¾ | 287 | 2 | 0 | 110 | 9 | 4 | 445 | 2 | 3¾ |
| ,, November, ,, | 185 | 8 | 7¼ | 273 | 4 | 0 | 110 | 9 | 4 | 569 | 5 | 11¼ |
| ,, December, ,, | 48 | 6 | 6 | 242 | 10 | 0 | 110 | 9 | 4 | 401 | 9 | 10 |
| Total, .... | 681 | 5 | 3 | 2,891 | 2 | 0 | 1,327 | 0 | 0 | 4,899 | 7 | 3 |

FORT WILLIAM, COMMIST. OFFICE,
*17th January*, 1837.

(*Signed*) S. HAWKINS,
*Depy. Asst. Comy. Genl.*

(True Copy) CHARLES C. EGERTON,
*Superintendent of the Eye Infirmary.*

# No. 65. (F)

*Abstract of Monthly Supplies to the Eye Infirmary, during the year* 1837.

| | Bazar Medicine and Necessaries | | | Allowance of Patients. | | | Establishment. | | | Total. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| For January, 1837. | 21 | 0 | 6 | 226 | 6 | 0 | 110 | 9 | 4 | 357 | 15 | 10 |
| .. February, .. | 75 | 3 | 1 | 238 | 6 | 0 | 110 | 9 | 4 | 424 | 2 | 5 |
| .. March, .. | 43 | 3 | 10 | 271 | 4 | 0 | 110 | 9 | 4 | 425 | 1 | 2 |
| .. April, .. | 43 | 0 | 9 | 264 | 4 | 0 | 110 | 9 | 4 | 417 | 14 | 1 |
| .. May, .. | 51 | 7 | 7 | 263 | 12 | 0 | 110 | 9 | 4 | 425 | 12 | 11 |
| .. June, .. | 99 | 0 | 8 | 294 | 10 | 0 | 110 | 9 | 4 | 504 | 4 | 0 |
| .. July, | 49 | 1 | 8 | 279 | 0 | 0 | 110 | 9 | 4 | 438 | 11 | 0 |
| .. August, .. | 41 | 3 | 11 | 280 | 2 | 0 | 110 | 9 | 4 | 431 | 15 | 3 |
| .. September, .. | 46 | 0 | 7 | 270 | 6 | 0 | 110 | 9 | 4 | 426 | 15 | 11 |
| .. October, .. | 41 | 8 | 2 | 271 | 6 | 0 | 110 | 9 | 4 | 423 | 7 | 6 |
| .. November, .. | 46 | 13 | 1¾ | 233 | 6 | 0 | 110 | 9 | 4 | 390 | 12 | 5¾ |
| .. December, .. | 155 | 4 | 10 | 249 | 4 | 0 | 110 | 9 | 4 | 515 | 2 | 2 |
| Total, .. | 713 | 0 | 8¾ | 3,142 | 2 | 0 | 1,327 | 0 | 0 | 5,182 | 2 | 8¾ |

FORT WILLIAM, COMMIST. OFFICE,
*1st February*, 1838.

(*Signed*) W. DOVETON,
*Depy. Asst. Comy Genl.*

(True Copy)
CHARLES C. EGERTON,
*Superintendent of the Eye Infirmary*

# No. 65 (G)

*Annual Return of the Eye Infirmary for the year* 1833.

| Disease | Remaining last report | Admitted since | Total | Restored to perfect sight or cured by operation of Medical treatment | Restored to a degree of sight or relieved | No better | Died | Absconded | Remaining | Out-Patients |
|---|---|---|---|---|---|---|---|---|---|---|
| Cataract | 14 | 91 | 105 | 49 | 9 | 12 | 2 | 13 | 20 | 130 |
| Acute Ophthalmia | 9 | 4 | 13 | 7 | 2 | 1 | 0 | 2 | 1 | 99 |
| Chronic Ophthalmia | 0 | 18 | 18 | 9 | 4 | 1 | 0 | 3 | 1 | 110 |
| Purulent Ophthalmia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 |
| Pustular Ophthalmia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Vascular Cornea | 0 | 6 | 6 | 2 | 2 | 0 | 0 | 0 | 2 | 13 |
| Ulcer of the Cornea | 1 | 22 | 23 | 13 | 2 | 0 | 2 | 2 | 4 | 53 |
| Opacities of the Cornea | 2 | 1 | 3 | 0 | 1 | 0 | 0 | 0 | 2 | 73 |
| Interstitial Abscess of the Cornea | 0 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 26 |
| Slough of the Cornea | 0 | 11 | 11 | 3 | 4 | 0 | 1 | 2 | 1 | 23 |
| Stapphyloma | 0 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 2 |
| Inflammation of the Internal Tunics | 13 | 57 | 70 | 43 | 5 | 2 | 2 | 11 | 7 | 100 |
| Prolapsus Iridis | 0 | 3 | 3 | 1 | 0 | 0 | 0 | 2 | 0 | 4 |
| Closed Pupil | 3 | 4 | 7 | 1 | 2 | 2 | 1 | 1 | 0 | 2 |
| Glaucoma, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| Amaurosis, | 7 | 20 | 27 | 8 | 2 | 11 | 1 | 5 | 0 | 11 |
| Incipient Amaurosis | 4 | 33 | 37 | 18 | 1 | 2 | 6 | 8 | 2 | 179 |
| Nyctalopia | 0 | 9 | 9 | 7 | 1 | 0 | 0 | 0 | 1 | 18 |
| Conical Cornea | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Tumour on the Conjunctiva | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Extravasation of blood under the Tunica Conjunctiva, | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Ptery-gium | 0 | 5 | 5 | 1 | 2 | 0 | 0 | 2 | 0 | 4 |
| Lippitudo, | 0 | 5 | 5 | 3 | 1 | 1 | 0 | 0 | 0 | 16 |
| Entropium, | 1 | 3 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 3 |
| Erysipelas of the Eyelid | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Hydrops Oculi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Epiphora, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| Obstruction of the Nasal duct | 0 | 4 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 25 |
| Protrusion of the Eye, | 1 | 2 | 3 | 2 | 1 | 0 | 0 | 0 | 0 | 1 |
| Suppuration of the Eye | 0 | 8 | 8 | 2 | 3 | 0 | 1 | 1 | 1 | 15 |
| Pus in the Antr Chamber | 0 | 5 | 5 | 3 | 0 | 0 | 0 | 1 | 1 | 0 |
| Yielding of the Sclerotic | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 10 |
| Irregular Pupil | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| Ptosis, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| Encysted Tumour of the Eyelid, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Hardeolum, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| Total ... | 55 | 319 | 374 | 184 | 43 | 32 | 16 | 54 | 45 | 999 |

Grand Total . . . 1,373

# No. 65. (H)

*Statement of the Expenses of the Eye Infirmary during the year* 1833.

| | Amount. | | |
|---|---|---|---|
| Staff allowance of the Superintendent, being Sonat Rupees 525 per mensem, per annum ... ... ... ... ... ... ... | 5,428 | 7 | 2 |
| Rent of the premises occupied for the purposes of the Eye Infirmary, being Sicca Rupees 250 per mensem, per annum ... ... .. ... | 3,000 | 0 | 0 |
| Expenses of the Native Establishment, Country Medicines, and Dieting the patients, as per annexed abstract ... ... ... . . ... | 3,924 | 3 | 9½ |
| Total, .... | 12,352 | 10 | 11½ |

(*Signed*) CHARLES C. EGERTON,
*Superintendent of the Eye Infirmary.*

CALCUTTA EYE INFIRMARY,
21*st November*, 1838.

# No. 65. (1)

*Annual Return of the Eye Infirmary for the year 1834*

| Diseases | Remaining last report | Admitted since | Total | Restored to perfect sight or cured by operation of Medical treatment. | Restored to a degree of sight or relieved | No better | Died | Absconded | Remaining. | Out-Patients |
|---|---|---|---|---|---|---|---|---|---|---|
| Cataract .. | 20 | 94 | 114 | 56 | 7 | 7 | 8 | 17 | 19 | 155 |
| Acute Opthalmia | 1 | 30 | 31 | 23 | 3 | 0 | 0 | 1 | 4 | 173 |
| Chronic Opthalmia . . | 1 | 19 | 20 | 10 | 2 | 2 | 0 | 4 | 2 | 80 |
| Purulent Opthalmia | 0 | 1 | 1 | 3 | 0 | 0 | 0 | 0 | 1 | 20 |
| Pustular Opthalmia . | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 27 |
| Ulcer of the Cornea, . | 4 | 29 | 33 | 16 | 5 | 0 | 0 | 2 | 11 | 56 |
| Vascular Cornea .. . | 2 | 12 | 14 | 8 | 5 | 0 | 0 | 0 | 1 | 16 |
| Opacities of the Cornea .. | 2 | 5 | 7 | 3 | 1 | 0 | 0 | 0 | 3 | 60 |
| Interstial Abscess of the Cornea | 0 | 8 | 8 | 4 | 0 | 0 | 0 | 1 | 3 | 39 |
| Slough of the Cornea, | 1 | 9 | 10 | 7 | 0 | 0 | 1 | 1 | 1 | 19 |
| Wound of the Cornea | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 4 |
| Wound of the Conjunctiva . | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Closed Pupil . . | 0 | 3 | 3 | 0 | 0 | 1 | 1 | 0 | 1 | 5 |
| Inflammation of the Internal Tunics, .. . | 7 | 36 | 43 | 27 | 8 | 0 | 0 | 3 | 5 | 123 |
| Amaurosis, .. | 2 | 24 | 26 | 13 | 4 | 8 | 0 | 1 | 0 | 18 |
| Impaired Vision | 0 | 15 | 15 | 8 | 2 | 1 | 0 | 1 | 3 | 205 |
| Nyctalopia . . | 1 | 52 | 53 | 35 | 1 | 2 | 5 | 4 | 6 | 36 |
| Pus in the Anterior Chamber, | 1 | 6 | 7 | 4 | 1 | 0 | 0 | 0 | 2 | 11 |
| Lens in the Anterior Chamber | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Suppuration of the Eye, | 1 | 17 | 18 | 13 | 1 | 0 | 3 | 1 | 0 | 18 |
| Yielding of the Sclorotic, . | 0 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 2 |
| Glaucoma, . .. . | 0 | 3 | 3 | 0 | 1 | 2 | 0 | 0 | 0 | 12 |
| Stapphyloma .. . | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 6 |
| Ptery-gium, . . | 0 | 5 | 5 | 4 | 1 | 0 | 0 | 0 | 0 | 16 |
| Entropium . . | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 8 |
| Tinea, .. . | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 10 |
| Ptosis, | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 6 |
| Obliteration of the Puncta | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Tumour on the Eyelid . | 0 | 2 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 4 |
| Abscess of the Eyelid | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| Odema of the Eyelid, | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Obstruction of the Nasal duct | 0 | 5 | 5 | 3 | 1 | 0 | 0 | 0 | 1 | 48 |
| Epiphora, .. . | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 23 |
| Prolapsus Iridis, . | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 4 |
| Lippitudo, .. .. . | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 20 |
| Invertion of the Tarsus | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Carcinoma of the Eye, . | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Extravasation of blood under the Tunica Conjunctiva . | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 4 |
| Total, .. . | 45 | 399 | 445 | 256 | 43 | 23 | 19 | 37 | 67 | 1230 |
| Grand Total . | | | | | | | | | | 1675 |

# No. 65. (J)

*Statement of the Expenses of the Eye Infirmary during the year* 1834.

| | Amount. | | |
|---|---|---|---|
| Staff allowance of the Superintendent, being Sonat Rs. 525 per mensem, per annum .. .. .. .. .. .. .. .. | 5,428 | 7 | 2 |
| Rent of the Premises occupied for the purposes of the Eye Infirmary, being Sicca Rs. 250 per mensem, per annum .. .. .. .. | 3,000 | 0 | 0 |
| Expenses for Native Establishment, Country Medicines, Dieting the patients, &c. as per annexed abstract .. .. .. .. .. | 5,031 | 1 | 11½ |
| Grand Total, .. | 13,459 | 9 | 1½ |

*(Signed)* CHARLES C. EGERTON,
*Superintendent of the Eye Infirmary.*

CALCUTTA EYE INFIRMARY,
21*st November*, 1838.

## No. 65. (K)

*Annual Return of the Eye Infirmary, for the year 1835.*

| Diseases. | Remaining last report. | Admitted since. | Total. | Restored to perfect sight or cured by operation of Medical treatment. | Restored to a degree of sight or relieved. | No better. | Died. | Absconded. | Remaining. | Out-Patients. |
|---|---|---|---|---|---|---|---|---|---|---|
| Cataract, | 19 | 87 | 106 | 71 | 4 | 4 | 2 | 11 | 14 | 171 |
| Acute Ophthalmia, | 4 | 28 | 32 | 29 | 2 | 0 | 0 | 1 | 0 | 193 |
| Chronic Ophthalmia, | 2 | 19 | 21 | 7 | 1 | 1 | 3 | 2 | 7 | 98 |
| Purulent Ophthalmia, | 1 | 5 | 6 | 3 | 0 | 1 | 0 | 2 | 0 | 22 |
| Pustular Ophthalmia, | 0 | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 22 |
| Ulcer of the Cornea, | 11 | 33 | 44 | 32 | 3 | 0 | 1 | 1 | 7 | 54 |
| Vascular Cornea, | 1 | 12 | 13 | 7 | 3 | 1 | 0 | 1 | 1 | 14 |
| Opacities of the Cornea, | 3 | 2 | 5 | 3 | 0 | 0 | 0 | 0 | 2 | 36 |
| Interstitial Abscess of the Cornea, | 3 | 13 | 16 | 13 | 2 | 0 | 0 | 1 | 0 | 39 |
| Slough of the Cornea, | 1 | 4 | 5 | 0 | 0 | 0 | 1 | 1 | 3 | 17 |
| Wound of the Cornea, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| Contracted Pupil, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Closed Pupil, | 1 | 4 | 5 | 1 | 1 | 1 | 1 | 0 | 1 | 3 |
| Inflammation of the Internal Tunics, * | 5 | 43 | 48 | 31 | 4 | 2 | 1 | 0 | 10 | 97 |
| Amaurosis. | 0 | 9 | 9 | 4 | 0 | 3 | 0 | 1 | 1 | 24 |
| Impaired Vision, | 3 | 13 | 16 | 9 | 3 | 2 | 1 | 1 | 0 | 156 |
| Nyctalopia, | 6 | 35 | 41 | 28 | 3 | 0 | 5 | 0 | 5 | 29 |
| Pus in the Anterior Chamber, | 2 | 9 | 11 | 6 | 1 | 1 | 2 | 1 | 0 | 7 |
| Lens in the Anterior Chamber, | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Suppuration of the Eye, | 0 | 12 | 12 | 7 | 3 | 1 | 0 | 0 | 1 | 19 |
| Yielding of the Sclorotic, | 1 | 6 | 7 | 6 | 0 | 0 | 0 | 0 | 1 | 3 |
| Glaucoma, | 0 | 2 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 8 |
| Stapplyloma, | 0 | 6 | 6 | 1 | 0 | 0 | 0 | 2 | 0 | 3 |
| Ptery-guim, | 0 | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 6 |
| Entropium, | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| Tinea, | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 21 |
| Ptosis, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| Obliteration of the Puncta, | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Tumour of the Eyelids, | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 3 |
| Abscess of the Eyelids, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Tumour situated within the orbit, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Obstruction of the Nasal duct, | 1 | 9 | 10 | 6 | 0 | 0 | 0 | 2 | 2 | 45 |
| Epiphora, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Prolapsus Iridis, | 0 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 7 |
| Lepitudo, | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 12 |
| Carcinoma of the Eye, | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Extravasation of blood under the Tunica Conjunctiva, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| Pustular Inflammation of the Eye, | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ulceration of the Eyelids from injury, | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Protrusion of the Eye, | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Warty excrescence growing from the Tunica Conjunctiva, | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 2 |
| Ulcer of the Conjunctiva, | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Inursion of the Eyelashes, | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ulcer of the Eyelids, | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Strumous Ophthalmia, | 0 | 2 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 3 |
| Total, | 67 | 372 | 439 | 283 | 34 | 17 | 18 | 29 | 58 | 1144 |

Grand Total, 1583

# No. 65. (L)

*Statement of the Expenses of the Eye Infirmary during the year 1835.*

| | Amount. | | |
|---|---|---|---|
| Staff allowance of the Superintendent, being Sonat Rs. 525 per mensem, per annum, .. .. .. .. .. .. .. .. | 5,428 | 7 | 2 |
| Rent of the Premises occupied for the purposes of the Eye Infirmary, being Sicca Rs. 250 per mensem, per annum, .. .. .. | 3,000 | 0 | 0 |
| Expenses for Native Establishment. Country Medicines, Dieting the patients, &c. as per annexed abstract .. .. .. .. .. | 4,880 | 4 | 11½ |
| Total,.... | 13,308 | 12 | 1½ |

*(Signed)* CHARLES C. EGERTON,

*Superintendent of the Eye Infirmary.*

CALCUTTA EYE INFIRMARY,
21*st November*, 1838.

# No. 65. (M)

*Annual Return of the Eye Infirmary, for the year 1836*

| Diseases | Remaining last Report. | Admitted since. | Total. | Restored to perfect sight or cured by operation of Medical treatment. | Restored to a degree of sight or relieved. | No better. | Died. | Absconded. | Remaining. | Out-Patients. |
|---|---|---|---|---|---|---|---|---|---|---|
| Cataract, | 14 | 92 | 106 | 79 | 3 | 7 | 2 | 10 | 5 | 158 |
| Acute Ophthalmia, | 0 | 46 | 46 | 29 | 4 | 0 | 0 | 5 | 8 | 273 |
| Chronic Ophthalmia, | 7 | 15 | 22 | 11 | 7 | 0 | 0 | 2 | 2 | 126 |
| Purulent Ophthalmia, | 0 | 5 | 5 | 3 | 1 | 0 | 0 | 1 | 0 | 10 |
| Pustular Ophthalmia, | 0 | 6 | 6 | 3 | 1 | 0 | 0 | 1 | 1 | 32 |
| Ulcer of the Cornea, | 7 | 46 | 53 | 44 | 6 | 1 | 0 | 1 | 1 | 64 |
| Vascular Cornea, | 1 | 7 | 8 | 4 | 2 | 0 | 0 | 0 | 2 | 9 |
| Opacities of the Cornea, | 2 | 5 | 7 | 2 | 1 | 2 | 0 | 1 | 1 | 25 |
| Interstitial Abscess of the Cornea | 0 | 30 | 30 | 17 | 5 | 0 | 0 | 3 | 5 | 37 |
| Slough of the Cornea, | 3 | 17 | 20 | 10 | 5 | 0 | 1 | 1 | 3 | 38 |
| Wound of the Cornea, | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 5 |
| Contracted Pupil, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Closed Pupil, | 1 | 3 | 4 | 1 | 1 | 1 | 0 | 1 | 0 | 9 |
| Inflammation of the Internal Tunics, | 10 | 59 | 69 | 47 | 6 | 1 | 1 | 4 | 10 | 78 |
| Amaurosis, | 1 | 21 | 22 | 7 | 1 | 7 | 1 | 2 | 4 | 19 |
| Impaired Vision, | 0 | 16 | 16 | 12 | 2 | 1 | 0 | 0 | 1 | 182 |
| Nyctalopia, | 5 | 29 | 34 | 21 | 2 | 2 | 2 | 2 | 5 | 27 |
| Pus in the Anterior Chamber, | 0 | 8 | 8 | 5 | 1 | 0 | 0 | 1 | 1 | 7 |
| Lens in the Anterior Chamber | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Suppuration of the Eye, | 1 | 5 | 6 | 4 | 1 | 0 | 1 | 0 | 0 | 5 |
| Yielding of the Scloratic, | 1 | 3 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 5 |
| Glaucoma, | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 5 |
| Stapphyloma, | 0 | 7 | 7 | 4 | 2 | 0 | 0 | 1 | 0 | 2 |
| Ptery-gium, | 0 | 4 | 4 | 3 | 0 | 0 | 0 | 1 | 0 | 7 |
| Entropium, | 1 | 7 | 8 | 6 | 1 | 0 | 0 | 0 | 1 | 5 |
| Tinea Tarsi, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| Ptosis, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Obliteration of the Puncta, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Tumour of the Eyelids, | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tumour situated within the orbit, | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Abscess of the Eyelid, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| *Obstruction of the Nasal duct, | 2 | 11 | 13 | 10 | 0 | 0 | 1 | 0 | 0 | 51 |
| Epiphora, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| Prolapsus Iridis, | 0 | 5 | 5 | 3 | 0 | 0 | 0 | 1 | 1 | 8 |
| Lippitudo, | 0 | 5 | 5 | 3 | 1 | 0 | 0 | 0 | 1 | 10 |
| Extravasation of blood under the Tunica Conjunctiva, | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 9 |
| Yielding of the Cornea, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Irregular Pupil, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Incyested of the Eyelid, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Ulcer of the Eyelid from injury, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Ulcer of the Eyelid, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Strumous Ophthalmia, | 0 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| Tumour of the Tunica Conjunctiva, | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Tumour of the Eye, | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Fungus Himatodus, | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Total | 58 | 462 | 520 | 337 | 54 | 25 | 9 | 40 | 55 | 1243 |

Grand Total, .. 1763

# No. 65. (N)

*Statement of the Expenses of the Eye Infirmary during the year, 1836.*

| | Amount. | | |
|---|---|---|---|
| Staff allowance of the Superintendent, being Sonat Rs. 525 per mensem, per annum, .. .. .. .. .. | 5,428 | 7 | 2 |
| Rent of the Premises occupied for the purposes of the Eye Infirmary, being Sa. Rs. 250 per mensem, per annum. .. .. ... | 3,000 | 0 | 0 |
| Expenses for the Native Establisment, Country Medicines, Dieting the patients, &c. as per annexed abstract, .. .. ... | 4,899 | 7 | 3 |
| Total, .. | 13,327 | 14 | 5 |

*(Signed)* CHARLES C. EGERTON,
*Superintendent of the Eye Infirmary.*

CALCUTTA EYE INFIRMARY,
21*st November*. 1838.

# No. 65. (o)

*Annual Return of the Eye Infirmary for the year 1837.*

| Diseases. | Remained last Report. | Admitted since. | Total. | Restored to perfect Sight, or cured by operation or Medical treatment. | Restored to a degree of sight, or relieved. | No better. | Died. | Absconded. | Remaining. | Out-Patients. |
|---|---|---|---|---|---|---|---|---|---|---|
| Cataract, .. .. | 5 | 106 | 111 | 77 | 2 | 6 | 1 | 10 | 15 | 119 |
| Acute Ophthalmia, .. | 8 | 69 | 77 | 50 | 10 | 2 | 2 | 5 | 8 | 318 |
| Chronic Ophthalmia, .. | 2 | 40 | 42 | 26 | 7 | 1 | 2 | 4 | 2 | 178 |
| Pustular Ophthalmia, .. | 1 | 8 | 9 | 8 | 0 | 0 | 0 | 1 | 0 | 31 |
| Strumous Ophthalmia, .. | 1 | 2 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 3 |
| Ulcer of the Cornea, .. | 2 | 41 | 43 | 29 | 8 | 1 | 1 | 1 | 3 | 48 |
| Interstial Abscess of the Cornea, .. .. | 5 | 17 | 22 | 17 | 1 | 0 | 0 | 0 | 1 | 29 |
| Opacities of the Cornea, .. | 1 | 4 | 5 | 2 | 1 | 0 | 0 | 0 | 2 | 38 |
| Vascular Cornea, .. | 2 | 13 | 15 | 8 | 3 | 1 | 0 | 3 | 0 | 7 |
| Inflammation of the Internal Tunics, .. .. | 10 | 56 | 66 | 41 | 11 | 3 | 1 | 6 | 1 | 81 |
| Amaurosis, .. .. | 4 | 16 | 20 | 2 | 1 | 12 | 0 | 0 | 5 | 17 |
| Impaired Vision, .. | 1 | 13 | 14 | 10 | 0 | 3 | 1 | 0 | 0 | 136 |
| Nyctalopia, .. .. | 5 | 31 | 36 | 20 | 4 | 0 | 6 | 5 | 1 | 29 |
| Obstruction of the Nasal duct, .. .. | 2 | 21 | 23 | 18 | 1 | 1 | 0 | 1 | 2 | 52 |
| Entropium, .. .. | 1 | 11 | 12 | 7 | 4 | 0 | 0 | 1 | 0 | 6 |
| Pus in the Anterior Chamber, .. .. | 1 | 9 | 10 | 1 | 2 | 0 | 1 | 2 | 1 | 13 |
| Lippitudo, .. .. | 1 | 5 | 6 | 4 | 1 | 0 | 0 | 0 | 1 | 10 |
| Prolapsus Iridis, .. | 1 | 7 | 8 | 5 | 1 | 1 | 1 | 0 | 0 | 10 |
| Ptery-guim, .. .. | 0 | 10 | 10 | 4 | 1 | 0 | 1 | 3 | 1 | 4 |
| Closed Pupil, .. .. | 0 | 8 | 8 | 2 | 0 | 3 | 0 | 2 | 1 | 6 |
| Stapphyloma, .. | 0 | 8 | 8 | 5 | 1 | 0 | 1 | 1 | 0 | 0 |
| Suppuration of the Eye, .. | 0 | 7 | 7 | 3 | 2 | 0 | 1 | 1 | 0 | 6 |
| Tumour on the Eyelids, .. | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| Purulent Ophthalmia, .. | 0 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 24 |
| Yielding of the Cornea, .. | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 2 |
| Tenia Tarsi, .. .. | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 13 |
| Ptosis, .. .. .. | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 4 |
| Inversion of the Upper Eyelids, .. .. | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Glaucoma, .. .. | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 3 |
| Yielding of the Scloratic, .. | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| Fungus Hematodus, .. | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Wound of the Cornea, .. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Contracted Pupil, .. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Hardiolum, .. .. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Abscess of the Eyelid, .. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Epiphora, .. .. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| Extravasation of blood under the Tunica Conjunctiva, .. .. .. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| Stravesmus of the Eye, .. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Speck on the Cornea, .. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Slough of the Cornea, .. | 3 | 18 | 21 | 12 | 1 | 1 | 5 | 2 | 0 | 22 |
| Total, .. | 56 | 532 | 588 | 369 | 63 | 36 | 24 | 48 | 48 | 1268 |
| Grand Total, .. | | | | | | | | | | 1856 |

## No. 65. (P)

*Statement of the Expenses of the Eye Infirmary during the year 1837.*

| | Amount | | |
|---|---|---|---|
| Staff allowance of the Superintendent, being Sonat Rupees 525 per mensem, per annum, .. .. .. .. .. .. .. .. | 5,428 | 7 | 2 |
| Rent of the Premises occupied for the purposes of the Eye Infirmary, being Sicca Rupees 250 per mensem, per annum, .. .. .. | 3,000 | 0 | 0 |
| Expenses for Native Establishment, Country Medicines, dieting the patients, &c. as per annexed abstract, .. .. .. | 5,182 | 2 | 8¾ |
| Total, .. .. | 13,610 | 9 | 10¾ |

CALCUTTA EYE INFIRMARY, (*Signed*) CHARLES C. EGERTON,

21*st November*, 1838. *Superintendent of the Eye Infirmary.*

# No. 66.

## To THE HONOURABLE SIR J. P. GRANT.

No. 201

Sir,

In compliance with the request of the Fever Hospital and Municipal Improvement Committee, conveyed in your letter of the 31st ultimo, I am directed to transmit to you, herewith, a Copy of the Proceedings of a Committee assembled in July, 1826, for the purpose of surveying and reporting on the buildings constituting the present General Hospital at the Presidency. I am, Sir,

Your most obedient Servant,

J. STUART, *Lieut. Colonel.*

*Offg. Secy to Government of India, Military Department*

Council Chamber,
*14th January*, 1839

# No. 66. (A)

*Calcutta, July 12th, 1826.*

*Proceedings of a Special Committee assembled at the General Hospital, by order of the Right Honourable the Governour General in Council, for the purpose of surveying and reporting on the whole of the Buildings constituting the General Hospital at the Presidency of Fort William.*

W. A. Burke, Esq. M. D. Inspector of Hospitals H. M. Service, *President*
Lieutenant Colonel Wood, C. B. Garrison Engineer, Fort William,
Alexander Ogilvie, Esq. M. D. 3d. Member of the Medical Board,
Major William Swinton, Superintendent of Publick Works,
William Russell, Esq. M. D. Surgeon, General Hospital,
} *Members.*

The Committee, according to the Government directions conveyed in the letter of the Secretary to Government, Military Department, dated Council Chamber, 30th June, 1826, having taken into their consideration the following particulars, as therein specified,

1st. The present state of the Buildings occupied as a General Hospital ;

2d. Their fitness for the purpose to which they are appropriated, in respect of extent, plan, and construction ;

3d. Their capabilities (if at present insufficient) of improvement, by additions and alterations ;

4th. The expediency, with reference to their present value, and the probable expense, of making such additions or alterations ;

5th. The necessity or expediency of erecting an entirely new General Hospital for Military patients, on a more extensive scale, and of the most approved construction : and having attentively and minutely examined and surveyed the buildings of the General Hospital, and taken the whole subject into consideration, they are of opinion—That the Centre Building is calculated to hold eighty patients, and with the following additions, will be suitable to the purposes for which it was intended ; viz : The front of the building to be extended at each side, so as to admit of two corner rooms above,

and the same below, for the reception of patients of a better description, or higher class of Society, such as Naval Officers and Captains of Ships, for whom accommodation is much required, and the want of which is felt at present. The Committee recommend an open verandah of fourteen feet broad, all round, with fixed venetians and railings.

The two Wings, or Eastern and Western Hospitals, are extremely defective in point of plan and construction. The principal story is only eleven feet eight inches, and the upper story fourteen feet, in height; and the principal Wards only eighteen feet wide.

The Committee therefore consider them incapable of such improvement as would render them fit for the proper accommodation of sick; and after minute examination, and most mature consideration, are of opinion, that the construction of other buildings is indispensable for the accommodation of the Military sick; in the construction of which it is submitted as a chief preliminary consideration, the necessity of the space to be allotted for the sick being so ample, that there exist means of evacuating, purifying, and occupying the Wards in succession; for in places constantly occupied by sick, it has been experienced in numbers of instances, that the air soon becomes impure, notwithstanding every precaution—a cause, when produced, which serves to propagate disease, and to resist the perfect recovery of health in all. It is necessary, therefore, that the Hospital should be spacious and well constructed, so as to prevent evils which are greatly expensive of life, and consequently of money. They are of opinion that it is necessary to have two Hospitals of two stories erected as soon as possible, and each to be capable of containing one hundred patients, upon the most approved plan, and of the following dimensions—The two apartments composing the under and upper story to be internally in width twenty-four feet, in length two hundred and forty feet, or what may be necessary for the due and proper accommodation (according to the newest and most approved plans) of the number of patients as above proposed, and in height twenty feet—that there be to each an inner verandah all round, of fourteen feet wide; and an outer verandah on columns all round also, of fourteen feet wide, with fixed venetians, and a railing to prevent the patients falling over. The Committee are moreover of opinion, that the inner verandah should have glazed as well as venetian doors; for in foggy, damp, and cold weather the admission of external air is rather injurious than beneficial; being injurious it ought to be excluded, therefore sashed windows and doors are required as above; which would be also found necessary during the prevalence of hot winds, such as experienced here during the months of April and May last.

In this country the agitation of the air, so much contributing to its elasticity and to ventilation by the means of punkahs, being found so conducive to health and comfort, the Committee are of opinion that punkahs should be placed in the new Hospitals here, in the same manner as in that at Cawnpore, where they have been acknowledged to be of great advantage in expediting perfect recovery, and thereby fully repaying whatever expense they may occasion.

The Hospitals to be seven feet from the ground, and flued throughout.

The necessaries, and if practicable the water-closets, to be built at some distance from the Hospitals, to which they are to be connected by covered passages.

There must be also all requisite offices, such as Pharmacies, &c. and rooms for the Hospital attendants and servants; receiving rooms destined for the reception of patients, in which they are examined, classed, and equipped for their proper Wards; bathing-rooms for cold and warm baths, with all the necessary appendages, necessary, or useful, for conducting the important process of bathing in all its variety of forms; an apartment having a sky-light to serve occasionally for an operation room; also store rooms for the Steward's department; dead house; and washing house, &c.

The Committee are of opinion, that the site most eligible for the two new Hospitals, is on the ground to the westward adjoining to the compound of the General Hospital, and which is the property of Government, and is high and dry at the opposite side of the road, where at present there is an avenue of trees.

(*Signed*) W. BURKE, M. D. *Inspector of Hospl. H. M. Forces in India.*
J. WOOD, *Lieutenant Colonel & Member.*
A. OGILVIE, *3d. Member Medical Board.*
W. SWINTON, *Major and Member.*
(True Copy) W. RUSSELL, *M. D. Surgeon.*

J. STUART, *Lieut. Colonel,*
*Officiating Secy. to Gov. of India, Military Department.*

## No. 67.

*Queries to which Answers are requested by the Committee on the Fever Hospital and Municipal Improvements, from*

J. R. MARTIN, ESQ.,

*Surgeon of the Native Hospital.*

Q. 1. It has been stated to the Committee, that in July, 1835, the Regulations of the Presidency General Hospital, regarding the admission of patients into it were republished—that from 1817 till July, 1835, these Regulations had been practically suspended by general directions given to admit every sick person that is sick. European or American, brought to the Hospital, whatever might be his disease. These Regulations limit the admission of patients to such as bring tickets from certain persons mentioned therein, with a permission given to the resident Assistant Surgeons at the Hospital to use their discretion in admitting cases which they may think of emergency, reporting the same to the Medical Board ; since which republication it is stated that the number of seafaring people resorting to the Hospital has very greatly diminished ; and it appears from the Returns of the Hospital, that the number of seamen admitted during the two years 1833 and 1834, before the said republication, was 893, and that the number admitted during the two years 1836 and 1837, subsequent to the said republication, was reduced to 243. It also appears from the Returns that the number of paupers admitted during the two years 1833 and 1834, was 1257, and during the two years 1836 and 1837, only 238. It is understood that the establishment of an Hospital for seamen at Howrah has contributed both to produce the diminution in the number of seamen resorting to the General Hospital, and to remedy the difficulties offered to their admission, by enforcing the old Regulations ; but no explanation has been offered to the Committee of the mode in which this enforcement has operated to reduce so prodigiously the number of European paupers, not seafaring people, admitted ; nor has it been stated that any means have arisen, or been resorted to, for supplying this apparently alarming defalcation in the amount of good afforded by this admirable Institution ; nor have any grounds been suggested whereon to found a conclusion as to the actual amount of suffering or of mortality which it has occasioned. You have stated that you were for some time employed in the General Hospital. Are you aware that previous to July, 1835, cases were admitted into the General Hospital of seamen

who did not labour under any disease requiring Hospital treatment? And if any, what number of such cases do you suppose may have been received in a year? And for how long do you think any seamen have been kept and maintained in Hospital, after ceasing to require Medical aid, either as labouring under actual disease, or as convalescent?

*A.* The establishment of the Seaman's Hospital at Howrah can have had no influence whatever, in relieving the General Hospital from paupers, but quite the contrary. In effect, the Howrah Institution has removed from the General Hospital those cases only which went far to make it a school of practice for the young Assistant Surgeons on their arrival from Europe.

In respect to pauper seamen, the diminution stated must be ascribed to the checks of late put on their admission into the General Hospital. During the several occasions of my serving in the last named Institution, since 1819, all sick men were admitted into it without question; and such as proved themselves paupers to the satisfaction of the Steward and the Officers, were at the end of each month so registered, by authority from the Medical Board. Ever since the foundation of the Native Hospital, the unfortunate class of pauper Europeans have been in the continual habit of resorting to it for temporary relief; and such of them as required In-door treatment were sent to the General Hospital in karanchees, the cost of transport being charged to the Native Hospital. Since 1835, other modes of access to the General Hospital have been ordered; and I have had many opportunities of knowing that these last have worked vexatiously for the poor people in question. They have often returned to us, being unable to procure tickets of admission; and thus they have continued for days in their wretched abodes, under such management as we could order. Many have declared their inability to walk so far as the General Hospital, even when they obtained tickets, and deaths have been reported to us as having occurred under the circumstances stated. I have no recollection of seamen being admitted into the General Hospital, during my services there, who were not at the time labouring under actual illness. Invalid soldiers are often sent in on account of mere drunkenness; but no others that I remember.

*Q.* 2. The defalcation in the number of pauper cases treated within the two years last above-mentioned, as compared with the two years first above-mentioned, has been at the rate of between 509 and 510 cases per annum, or nearly five-sixths of the whole previous number. Do you believe that cases amounting to between 509 and 510 in number were received into the Hospital in any year previous to 1835 of patients, paupers, but not seafaring people, who did not labour under a disease requiring Hospital treatment in an European living in Calcutta? And if any, but not to so large an amount, what number of such cases do you think may have occurred in any year previous to 1835?

*A.* It is not possible that any considerable part of the numbers stated could have been received into the General Hospital without sufficient reason, that is, actual sickness, to warrant their being so received. The contrary would imply a general abuse, which could not occur without the knowledge and sanction of all the officers of the establishment, commissioned and non-commissioned.

*Q* 3. Do you believe that persons described in the Hospital's books as paupers, not seamen, to the above amount, or to any considerable amount in number, were received into the Hospital in any year previous to 1835, who, although labouring under some such disease as aforesaid, were able, from their pecuniary circumstances, to procure, in apartments of their own, and at their own expense, the medical aid, attendance, medicines, medical comforts, and purer air necessary to their cure, and afforded by the Hospital? And if to any, to what amount in number, and at what probable cost to the Hospital in any year?

*A.* No. The inquiries as to the circumstances of the patient, on being received into Hospital, were such as to satisfy the officers of the Institution, and the Medical Board also, as to the capability, or otherwise, of each individual to be placed under pecuniary stoppages; and no man was classed as pauper without due consideration.

The scrutiny may not have been severe; but I never heard that the Institution had been unnecessarily taxed with paupers during my services in it, or that its avowedly charitable objects had been overburdened.

*Q.* 4. Are you of opinion that the diminution in the number of seamen admitted, caused by the promulgation of the Rules acted upon 20 years ago, has been attended with practical detriment to the sick of the European seamen, who have frequented the Port of Calcutta since July, 1835, and if so to what extent? Or are you of opinion that the diminution in the amount of relief afforded them at the General Hospital has been compensated, and to what extent compensated, by the establishment of a Seaman's Hospital at Howrah? And do you know whether the Hospital at Howrah is in any degree a charitable Institution for the reception of pauper seamen?

*A.* I know that the operation of the order has been detrimental to European pauper health, but to what extent in actual numbers I cannot say. I believe the Howrah Seaman's Hospital receives no paupers.

*Q.* 5. It has been taken in a calculation of the saving of expense to the Government by the diminution in the number of merchant seamen received into the General Hospital, that the cost to the Government of each seaman received amounts to one Rupee per day, which is the sum chargeable by the Regulations of the Hospital to masters of merchant ships, all which ships are bound by law to pay for the expense of the cure of sailors serving on board them, who fall sick during a voyage, or are hurt in the performance of their duty. Is it to be understood that notwithstanding this Regulation nothing was exacted or recovered from masters of merchant ships, on account of merchant seamen received and treated in the General Hospital previous to 1835, but that their treatment was in all cases a dead loss to the Government? And if not in all cases, was it a loss to the Government in any very great proportion of the cases treated, and in what proportion? And if in any great proportion of cases, was not this loss occasioned by the negligence of the officers of the Hospital, or of some other officers of the Government?

*A.* I believe the Rupee per day has always been charged to ship-owners and captains, for the treatment of their sick int he Wards of the General Hospital; and if loss was at any time sustained by Government on account of such men, it must alone have arisen from neglect on the part of the officer whose duty it has always been to prevent such loss.

*Q.* 6. Does any such loss occur now in the small number of cases of merchant seamen which are now received and treated in the General Hospital? And in what way, and through whose fault, does such loss occur?

*A.* No such loss can occur without neglect.

*Q.* 7. Were there many cases previous to 1835, of merchant seamen applying to the General Hospital for Medical or Surgical relief who had deserted from their ships, or been left behind by them when in health, and falling sick or meeting with accidents after their ship had sailed, had no claim, or no claim which could be enforced, against any ship in harbour for the expense of their cure? And what proportion did these cases bear to those in which the sufferer had a legal claim against a ship in harbour for the expenses of his Medical or Surgical treatment? And what is the fact in the cases since 1835, in these several respects?

*A.* There were, and always must be such cases; but they can never be numerous

*Q.* 8. Were sailors previous to 1835, or are they now, having been left by their ships, or having outstayed their leave on shore or deserted, not generally paupers, and as such, entitled in your opinion, in common with other paupers when they fall into a condition requiring Medical or Surgical relief, to the benefits of an Institution maintained as a charitable Institution for the purpose, among other purposes, of affording Medical and Surgical relief to such poor Europeans or Americans as require it? And is not the Presidency General Hospital of Calcutta in your opinion an Institution of this nature?

*A.* The Institution is, and always has been, bound to treat such men. Not to do so would be to frustrate one of the chief objects of its foundation.

*Q.* 9. Do you know of any instances, or have you reason to believe that instances have occurred, and are frequently occurring, of poor persons, natives of Europe or America, who have been or are deterred, or impeded, or defeated, in their attempts to obtain admission into the General Hospital by the republication and enforcement of the ancient Regulations, and the requiring the production of tickets of admission previous to their being received into the Hospital, which persons, in respect of the diseases under which they laboured, or do labour, and of their destitute condition, or of their state of poverty, though not of utter destitution, were or are in your opinion fit objects of gratuitous Surgical or Medical treatment by an Institution, one of the principal purposes of ~~which~~ whose establishment and maintenance is the gratuitous administering of Surgical and Medical relief to persons who are objects of charity? And can you state whether any considerable addition has in your opinion been made to the continuance of disease, or the amount of suffering, or the amount of mortality, resulting from it, among those for whose relief this Hospital was instituted and is maintained, from the difficulties thus opposed to their admission?

*A.* I have answered much of this question before, and need only again add to my general affirmative, that many are deterred from seeking the relief which they formerly received in the General Hospital by the recent orders, and they have recourse to the wretched Wards of the Police Hospital, or allow their diseases to run their course in the Bazar.

*(Signed)* J. R. MARTIN.

NATIVE HOSPITAL,
*January* 10*th*, 1839

## No. 68.

*Question to which an Answer is requested by the Committee on the Fever Hospital and Municipal Improvements, from*

MR. P. O'BRIEN,

*Head Assistant of the Native Hospital.*

*Q.* Do you know of any instances, or have you reason to believe that instances have occurred, and are frequently occurring, of poor persons, natives of Europe or America, who have been or are deterred, or impeded, or defeated, in their attempts to obtain admission into the General Hospital by the republication and enforcement of the ancient Regulations, and the requiring the production of tickets of admission previous to their being received into the Hospital, which persons, in respect of the diseases under which they laboured.

or do labour, and of their destitute condition, or of their state of poverty, though not of utter destitution, were or are in your opinion fit objects of gratuitous Surgical or Medical treatment by an Institution, one of the principal purposes of ~~which~~ who establishment and maintenance is the gratuitous administration of Surgical and Medical relief to persons who are objects of charity? And can you state whether any considerable addition has in your opinion been made to the continuance of disease, or the amount of suffering, or the amount of mortality, resulting from it, among those for whose relief this Hospital was instituted and is maintained, from the difficulties thus opposed to their admission?

*A.* From the time I was appointed to the Native Hospital (July, 1834), up to 1836, all indigent persons (Europeans and Americans) who presented themselves at the Native Hospital were readily furnished with tickets of admission to the General Hospital; but since 1836, the privilege of granting admission tickets to paupers has been withdrawn from the Presidency Surgeons, who were before that period authorized to send paupers to the General Hospital; and since that time, all applicants for admission to the General Hospital have been directed to apply to the Chief Magistrate, whom they are obliged to address by petition, and by whom they are sent to the Police Hospital; at which place, four annas per diem is allowed for the dieting of each man. This is a plan of very doubtful economy, as a full establishment (the most expensive part of an Hospital) is still maintained at the General Hospital; as well as the establishment required for attendance on these people at the Police Hospital; and in addition to all, is the extra expense of four annas per diem for diet money for each man.

Many paupers, sailors, &c. who could not get admission into the General Hospital, have attended at the Native Hospital as Out-door patients, at the time they absolutely required In-door relief; and I know many instances in which individuals, so situated, have suffered for a long time.

For admission to the Wards of an Hospital for paupers, disease should be the only passport, or ticket; and the Medical Officers of the Institution should be allowed to admit the sick poor who present themselves for admission. This plan would save great delay, trouble, and expense, to the poor European applicant.

P. O'BRIEN.

## No. 69.

### ANSWERS BY W. RALEIGH, ESQ.,

*To the same queries to which answers were requested from J. R. Martin, Esq., by the Fever Hospital and Municipal Improvement Committee—Vide page 203.*

Q. 1.

*A.* It is necessary that I should premise my answers to the questions you have done me the honour to submit to me, by stating, that although I have been attached to the General Hospital as permanent Assistant Surgeon for fully ten years uninterruptedly, my duties have, during the whole of that period, been confined to the treatment of diseases, Surgical and Medical, and that the domestick economy of the Institution is regulated entirely by the Surgeon. It is consequently out of my power to afford from my own knowledge

any precise account of the pecuniary advantage or disadvantage which may have occurred to Government by the suspension or enforcement of the Regulations adverted to by you in your questions relative to the admission of patients, and their entertainment in the Hospital. I may probably, however, from the opportunity I have had of observing the working of both systems to which you allude, give you a practical opinion relative to the influence which the one or other has in increasing or diminishing the number of patients in Hospital, or, in other words, in extending or restricting the objects of charity. I may take the liberty of remarking, that it has ever appeared to me, that the exaction of " Hospital charges" from patients is at variance with the professed intentions of a charity, viz.—the relief of sick poor; and I have some satisfaction in bringing to the notice of the Committee the circumstance, that these heavy expenses fall nearly entirely on a class of individuals who are ill able to bear them, and who are, whether from their general good conduct in Hospital, or the circumstance of their being strangers in the country, deserving consideration. I allude to *sailors*. The ruinous effect of Hospital charges on the health and morals of these individuals I have frequent opportunity of witnessing, and may be thus briefly explained:—A sailor when sent to Hospital by the captain of his ship, may have 50 or 60 rupees due to him as wages; from which one rupee per day is deducted for as long as he may remain in Hospital! In order to rescue a portion of his property, he is induced to quit the Hospital before he is cured, is unable to procure employment in his unserviceable state, and resorts to the Bazar Punch-houses, where he lives in a state of drunkenness and exposure, and terminates his career by being sent to the House of Correction, or to the General (or Police) Hospital as a pauper, frequently in a hopeless condition.

Previous to 1835, as far as I can recollect, it was the custom to admit persons as patients of the General Hospital on personal application at the Institution, provided they appeared to be labouring under disease; but on Dr. Nicolson's being attached to the Hospital as Surgeon, he caused the Government Rules of the Hospital, with reference to admission, to be strictly acted up to, and patients have since that time only been admitted on recommendation of persons duly authorized to grant admission tickets. This circumstance has, in my opinion, tended to diminish the number of pauper patients considerably.

The establishment of the Howrah Hospital has undoubtedly reduced the number of seamen formerly received into the General Hospital, but this decrease does not arise from any " determination" of the sailors not to resort to the General Hospital, but on the means pursued by the proprietor of the Howrah Hospital to secure the sick of the shipping in harbour; such as visiting the ships on arrival, and sending boats round the fleet daily, to take the sick to Hospital, &c. which would of course not be in character with a Government Institution to adopt.

Q. 2.

*A.* I have been fully ten years attached to the Hospital, and am not aware that during that time any person has been admitted excepting for the relief of sickness; nor of any seaman having been detained for any considerable time after being cured and able to work. But I have known instances of disabled and bed-ridden paupers being entertained for a long time after their disorder had been considered incurable; such persons having no means of support, and incapable of gaining a livelihood.

Q. 3.

*A.* It can seldom occur that persons enabled to procure the comforts or necessaries in sickness at their own homes resort to an Hospital, and when such persons do so, they would be indignant at being classed as " paupers," and pay their expenses willingly. I do not recollect any patient of this description being a pauper patient.

Q. 4.

*A.* I have reason to suppose, that the restriction of admission into the General Hospital has deterred destitute sailors, and other paupers, from applying for relief until their disease has assumed a formidable character; but I consider the heavy charges to which sailors are subject the frequent original cause of their distress.

The Howrah Hospital in no way compensates for the relief which ought to be afforded by the General Hospital, or ameliorates the evils arising from its present Regulations. The Howrah Hospital is a private speculation, not a charity. The charges for a common sailor are the same as those of the General Hospital, and for an officer, double the General Hospital expense. As soon as a patient becomes destitute of the means of paying, he is discharged from the Howrah Hospital, and if not cured of his complaint resorts to the General Hospital, where he is received as a pauper; this is of frequent occurrence, and I state the circumstance on the authority of sick sailors admitted at the General Hospital on leaving the establishment at Howrah.

Q. 5.

*A.* It is a mistake to suppose that captains or owners of ships pay the Hospital charge of their sick sailors. The whole is deducted from the men's wages as long as they have any remaining, and then, should they not have left Hospital they are discharged, and re-admitted as paupers. I conceive it would be a humane act on the part of Government to abolish the Hospital charges altogether, or at any rate to equalize them. At present a sailor pays *one rupee* a day, whilst a soldier has only *two annas* deducted from his allowances for exactly the same medical treatment, diet, &c. I of course allude to Europeans and Americans ; no Natives are received at the General Hospital.

Q. 6.

*A.* I am not aware that any loss has been suffered by Government through negligence of the officers attached to the Hospital, during the past ten years.

Q. 7.

*A.* No doubt destitute seamen were often admitted as paupers, but the great proportion of sailors received at the Hospital are attached to ships at the time, and are sent by their captains, owners, or agents. Their expenses are however invariably defrayed by themselves from their wages, at a rate of one rupee per day ; for notwithstanding that there may exist a law compelling captains or owners of ships to pay the expenses of their sick seamen, such law is never enforced, and does not appear to be known to the sailors.

Q. 8.

*A.* Seamen under circumstances described in this 8th query, are always paupers and are in my opinion entitled to the benefits of a charity, such as the General Hospital.

Q. 9.

*A.* I certainly have known several instances of persons applying for admission at the General Hospital who have been requested to procure a regular admission order, and from circumstances have not done so ; and I have seen these persons going about Town afterwards in a deplorable condition. To questions put to some of these individuals on subsequently being sent into Hospital by the Police, they have stated that they experienced difficulty in earlier procuring an order of admission, either from being too ill to go for one, or not knowing how, or where, to procure one. I cannot however form any idea of the number of persons who may have been thus exposed to additional suffering, or of the extent to which their diseases may have increased by delay in obtaining Medical or Surgical aid, and there can be no doubt that their statements required in many instances to be received with caution, as their own negligence, or depraved habits, may too often have brought their misfortunes on themselves.

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## No. 70.

### ANSWERS BY S. NICOLSON, ESQ.

*To the same queries to which answers were requested from J. R. Martin, Esq. by the Fever Hospital and Municipal Committee*—*Vide p.* 203.

Q. 1.

*A.* Before I offer any explanation of this question I must remark, that the General Hospital, strictly speaking, is a Military Establishment; it having been transferred to the Military Department in the year 1786, when the Medical Board was instituted; but besides the sick of European Corps in Garrison, on their first arrival from Europe, who are received until their own Regimental Hospitals are prepared for them, the sick of European recruits, supernumeraries and invalids of the Queen's and Company's Army, the Hospital is open for the reception of seamen belonging to Her Majesty's or the Company's service, or to private and foreign ships, and also to European paupers, nor indeed are any Europeans in any other class of life refused admittance.

To those who can afford to defray their own expenses, and for sick men belonging to Her Majesty's or the Company's ships, or other vessels, a charge of one Sonat rupee per diem is made on account of each patient.

The management of the Hospital is conducted under the *fixed Military Regulations.* (vide Lushington.)

These are the Rules regarding which the Committee require information.

The Committee will see from the tenour of the Rules, that the General Hospital never could have been considered as a charitable Institution. On the contrary, every sick person that entered the Hospital must have been paid for by somebody at the rate of one Sonat rupee per diem, and formerly so strictly were these Rules enforced, that on many occasions while I was First Assistant at the Hospital, I admitted poor people, or those who had fallen into reduced circumstances, and their bills were always sent for payment to me, at the above mentioned rate of one Sonat rupee per diem.

But if any other proof were wanting to shew the real designation of the General Hospital, I may state, that the Hospital was actually held by contract since I came to this country, the Surgeon in charge drawing for each patient 30 Sonat rupees per mensem in addition to his personal salary of Sonat rupees six hundred, and for these allowances he was to supply the sick with diet, clothing, cots and bedding, with wine, bazar medicines, and every article the sick may require, Europe medicines and instruments excepted; he had also to supply Hospital and Shop servants conformably to a Table to be furnished by the Medical Board.

It appears clearly from these facts, that the Hospital could in no respect be considered a charitable Institution, the benefits of which were to be extended or limited at the will and pleasure of the Surgeon in charge of it. So far is this from being the case, that the Rules do not even give the Surgeon the power of admitting even an emergent case, without a regular ticket of admission from some of the individuals mentioned in the Table.

From 1807 till I left the Hospital in 1816, the business of the Hospital was conducted on these principles; and on my being appointed Surgeon to the Hospital in 1835, I expected to find the same system in operation. So far from finding this to be the case, I found the gates of the Hospital thrown open; every man who chose to run away from his ship, might walk into the Hospital under some frivolous complaint, and

walk out again without leave asked or given, as soon as his ship had taken her departure. Some of the worst characters about the Town, when their means were exhausted in every species of dissipation, were in the habit of resorting to the Hospital in the same manner, and remaining there only for a few days, went away, and returned again when they could not procure food elsewhere.

Not having been able to discover any order of Government for the continuance of this state of things, and believing that any directions that were ever given were only intended to continue to operate during the prevalence of the epidemick Cholera in 1817, and which should cease as soon as that disease disappeared; and, moreover, believing that the Surgeon of the Hospital might at any time be held personally responsible for one Sonat rupee per day, for every man admitted into the Hospital contrary to the Regulations of Government, I recommended the republication of the Rules, with the addition of conferring the power of admitting emergent cases upon the two resident Assistants at the Hospital, and likewise upon the Secretary to the District Charitable Society.

The direction, or order, or permission (for which I can discover no authority) which was given in 1817, must have entirely escaped the notice of the authority who issued it; as he never could have contemplated the suspension of the Government Regulations for twenty years; still less the effect of such a measure, namely, throwing upon the Government the whole expense of all the patients so irregularly admitted into the Hospital.

When I was appointed Surgeon to the General Hospital in 1835, I found the custom was to admit every man who offered, under whatever pretence he presented himself. If he had only been drunk, he was discharged the following day, or the next, to be admitted again as soon as he committed any irregularity. In this manner were men admitted several times in each month.

Towards the end of the month, when the monthly accounts were to be forwarded to the Commissariat, tickets of admission were made out by the Hospital Steward, and forwarded to the Secretary of the Medical Board for his signature, authorizing the admission into Hospital of individuals who were never seen by any of the Members of the Medical Board. I must here observe, that the Government, with the most liberal disposition for providing for the care and comfort of the sick, the destitute, and the poor of Calcutta, made ample provision for them by giving the Magistrates of Calcutta and the members of the Medical Board the liberty of granting admission tickets at its expense to such individuals as they considered fit objects for the charitable consideration of the Government. But I find no authority given to the Secretary of the Medical Board, or to any authority subordinate to the Magistrates of Calcutta, for sanctioning such irregular transactions; and I therefore referred the matter to Government, and the consequence was, the republication of the orders in 1835.

Even the Surgeon of the General Hospital, by the existing Rules, does not at this moment possess the power of admitting a patient into the Hospital, without paying one rupee a day for him.

I have reason to know that many people resorted to the Hospital who never could have procured admittance had the Rules of the Hospital been enforced, as already mentioned; and as an instance, I beg leave to shew the dates of admission and discharges of a seaman of the name of Thomas Newton, whom I found in the Hospital when I was appointed in March, 1835.

*Case of Thomas Newton.*

| When admitted. | By whom sent. | Discharged. | No. of days in Hospital. |
|---|---|---|---|
| 3d February, 1834. .. | His Captain, .. .. | 31st March, 1834, .. | 56 |
| 31st March, 1834, .... | Medical Board, .. .. | 8th May, 1835. .... | 404 |
| 9th January, 1836, .. | Police, .. .. .. | 6th February, 1837. .. | 393 |
| 9th May, 1838, .. .. | Medical Board, .... | 19th May, 1838, .. | 10 |
| | | Total, .. | 863 |

This man laboured under a disorder that might be easily cured, but he never would submit to have any thing done for him; and he was at last discharged, with a request to the Magistrates that he might never be sent back to the Hospital again, as the example had a very injurious tendency on other patients.

This man was in Hospital altogether for 863 days—for the first 56 days at the expense of his Captain; he afterwards returned to the Hospital, and remained there 807 days at the expense of Government.

Q. 2.

*A.* All the patients received into the Hospital without tickets of admission, whether sailors, towns-people, or destitute poor, were rated as paupers, because they were charged to the Government.

N. B. In looking over the Books since the above was written, I find other instances of the great loss sustained by Government; see Tables Nos. 1 and 2.

I.

*The case of Miss S. Bartlett, shewing how many times she was admitted into and discharged from the General Hospital.*

| Admission. | By whom sent. | Discharged. | No. of Days in Hospital. | Remarks. |
|---|---|---|---|---|
| 20th Dec. 1826, .. | Police, .. .. | 28th May, 1830, .. | 1,620 | A case of Paralysis of the lower extremities. |
| 16th July, 1831, .. | Police, .. .. | 2nd Dec. 1833, .. | 859 | |
| 19th Jan. 1835, .. | Medical Board, . | 20th Jan. 1835, died, | 1 | |
| | | Total days, .. | 2,480 | |

II.

*The case of John Thompson, seafaring pauper; was admitted into the General Hospital and discharged.*

| Admission. | By whom sent. | Discharged. | No. of Days in Hospital. | Remarks. |
|---|---|---|---|---|
| 3d Nov. 1826, .. | Medical Board, | 12th Oct. 1833, .. | 2,534 | This man was blind of Amaurosis. |

*Q.* 3.

*A.* A seaman entering with a ticket from the commander of his ship, was rated in the Books a seaman. I cannot answer the remainder of this question, as I was not appointed to the Hospital till March, 1835.

*Q.* 4.

*A.* I do not consider that the promulgation of the Rules have materially lessened the number of seafaring people who resort to the Hospital. They are admitted as seamen, having tickets of admission from their captains or from their agents, who are liable for their expenses while in Hospital.

I believe the whole of the sick who go to the Howrah Hospital would be sent to the General Hospital if no Hospital existed at Howrah ; as the latter is not a charitable Institution, and the expense is the same in both for seamen (and double for officers), one rupee a day. But the Howrah Hospital is so much nearer the shipping than the General Hospital, that the captains naturally send their men to that which is nearest, and therefore most convenient.

*Q.* 5.

*A.* The expense of every man admitted into the Hospital as a pauper from 1817 till 1835 was a dead loss to Government, and could not be caused by any negligence of the officers of the Hospital, or of any other department of the Government. It happened in consequence of the suspension of the Rules.

*Q.* 6.

*A.* There can be no loss now, as no man is admitted without authority from some of the Departments stated in the Table No. 6.

*Q.* 7.

*A.* I understand a number of deserters used to resort to the Hospital before 1835, and, bringing no admission tickets along with them, they were charged to the Government, as already stated.

I have already answered the concluding part of the question

*Q.* 8.

*A.* Already answered, see Answer to 1 and 2 Query.

*Q.* 9.

*A.* I do not believe there are any, as the resident Assistants now possess the power of granting admission tickets to all emergent cases who apply at the Hospital

Since the republication of the Rules in 1835, a man was admitted by the Steward, under a promise to procure an admission ticket from the Charitable Society or the Magistrates the following day, but, failing in this, Mr. Crawford had to pay 34 Rs. for his Hospital expenses, at the rate of one Sonat rupee per day.

S. NICOLSON,

*Surgeon General Hospital.*

# No. 71.

FROM SURGEON JAMES HUTCHINSON,
*Secretary to the Medical Board,*

TO THE HONBLE. SIR JOHN GRANT,
*Chairman of the Municipal Committee.*

No. 764.

SIR, *Fort William, 3rd January,* 1839.

I am directed by the Medical Board to acknowledge the receipt of your letter dated the 31st ultimo, and in compliance with the request therein contained, to forward to you the annexed copy of a despatch, No. 181, dated the 9th of July, 1830, to the address of the Board from Colonel Casement, C.B. Secretary to the Government of India in the Military Department.

The Board believe, that the communications of Dr. Dickson and Dr. McDowell, to which the despatch above-mentioned has reference, were forwarded by these gentlemen direct to Government, and not through this Office, indeed such may be inferred to have been the case from the tenour of the reply.

I have the honour to be,
Sir,
Your most obedient servant,
J. HUTCHINSON,
*Secretary to the Medical Board.*

# No. 71. (A)

No. 181. FROM COLONEL CASEMENT,
*Secretary to Government, Military Department,*

TO THE PRESIDENT AND MEMBERS OF THE MEDICAL BOARD.

GENTLEMEN, *9th July,* 1830.

The Governour General in Council has had under consideration two papers submitted to his Lordship by Members of your Board; the first by Mr. Dickson, Second Member, proposing to abolish as unnecessary the appointment of Surgeon to the General Hospital; and the second, by Mr. McDowell, Officiating Third Member, objecting to that measure generally, on publick grounds, and protesting against it individually, as an arrangement which would place him in a situation incompatible with his rank and station in the service.

2. A General Hospital is an institution of great and acknowledged utility; and in weighing the conflicting opinions of your second and third Members, the Governour General in Council has seen reason to conclude, that the establishments of the Calcutta General Hospital were, in the first instance, advisedly and judiciously fixed on a scale calculated to secure, through efficient Medical Officers, all the advantages to be derived from such an Institution.

3. To ensure the benefits of experience, so essential to Medical skill, and successful practice, in a tropical climate, it was deemed proper to place the management in the hands of a Surgeon, and to provide able assistants to carry on the details under his orders. Such indeed appears to be the plan observed in all similar establishments in Europe, and it corresponds with the arrangement for the performance of Regimental Medical duties which obtains in H. Majesty's and the Honourable Company's services.

4. That the duties might be performed by an Assistant Surgeon, as well as by a Surgeon, there appears no reason to doubt. In the designation there is nothing; and that an individual who is qualified as a Surgeon for the office, was, for some time at least prior to his promotion, equally well qualified as an Assistant Surgeon, is self evident; but in all permanent arrangements, some fixed principle is required; and if experience be considered of any avail, a rule must be observed which will command it.

5. With reference to Mr. Dickson's position—that the appointment of Surgeon to the Calcutta General Hospital is wholly unnecessary and superfluous; the Governour General in Council observes, that from the first formation of the Institution to the present time, a period of about fifty years, the prevailing system has existed with the knowledge and sanction of all preceding Medical Boards—a fact which affords a strong presumption that your second Member underrates the value of the Surgeon's services

6. According to Mr. Dickson's view of the subject, all ordinary details of attending to the sick, and managing the internal economy of the establishment, devolve on the assistants, while whatever controulling power may be requisite is exercised *de-officio* by the Superintending Surgeon. But Mr. McDowell, on the other hand, declares, that his own duties, as Junior Member of the Board, will not admit of his assuming charge of the internal subordinate details and management of the General Hospital, were even such duties compatible with his rank and official station

7. In the opinion of the Governour General in Council, a distinct controulling power is indispensable in such Institutions, and ought to be in the hands of a responsible officer. In the General Hospital, where the duties are important, there being always a large proportion of cases of the most serious character, that officer should be a Surgeon, in order that he may possess the necessary experience. At the same time, it is not desirable that the Surgeon at the head of such an establishment should devote his attention to a part only of the patients, with the view of diminishing the duties of the assistants, the numbers of which ought to be proportioned to their labours; but it is fit that the general controul and management should have the benefit of his knowledge and experience, and that the economy and Medical practice of the Hospital should be so regulated under his direction, that the object of the Institution may be most effectually attained. If the Surgeon succeed in fulfilling in those respects the expectations of Government, he certainly performs all that can be demanded of him as a publick servant.

8. Mr. Dickson next proposes, that if the controul of a Surgeon be still considered essential, the duties should be performed by the Garrison Surgeon of Fort William; an arrangement objected to by Mr. McDowell, who affirms that the labours of the Garrison Surgeon will not admit of any addition—an affirmation which appears to the Governour General in Council to be borne out by the fact, that repeated applications, sanctioned and supported by the Medical Board, have (prior even to the removal of the sanatarium for sick officers into Fort William) been made to Government to relieve the Garrison Surgeon from a portion of his duties, or to increase his staff salary. Mr. Dickson further appears to labour under a mistake, in supposing that the General Hospital is the Garrison Hospital of Fort William; part of the building is undoubtedly appropriated to the use of the European Regiment in Garrison, of which the sick are attended by the Regimental Medical Staff, and other patients occasionally sent thither from Fort William; but, the great majority of persons receiving Medical treatment at the General Hospital belongs to the various classes of people residing or sojourning in Calcutta, or connected with its port.

9. It is doubtless desirable that the most rigid economy should be observed in all publick establishments, but it would not be wise to urge retrenchment to an extent that would utterly ruin the prospects of a service, on the well-being of which the very utility of the Institutions themselves depends. An extension of the principle recommended by Mr. Dickson would no doubt occasion a considerable saving; but, if generally applied, it would throw all orders of the service into confusion, and subvert the present constitution of the Medical Establishment. For example, there is nothing in the duties of the Members of your Board, of Superintending Surgeons, or of Regimental or Civil Surgeons, that could not be equally well performed by individuals holding the rank of Assistant Surgeon, and on diminished allowances; but such a principle cannot be acted upon; the claims of service and seniority, combined with those of talent and conduct, must command attention.

10. For the foregoing reasons the Governour General in Council deems it inexpedient to adopt either of Mr. Dickson's suggestions; but should the present Medical establishment of the General Hospital be considered too large for the average number of patients, his Lordship in Council will not object to such necessary reductions as will not violate the ordinary principles of the service.

11. The Governour General in Council would not consider it equitable to remove the Superintendent of an Institution which effects the objects for which it was established, on the grounds of his not labouring at the detail duties; and his Lordship in Council is decidedly of opinion, that if a Surgeon and Assistant Surgeon are deemed necessary for each Regiment, the duties can scarcely be efficiently performed in an Hospital containing upon an average from sixty to one hundred patients, many of them labouring under diseases in their worst forms, by a smaller number of Medical Officers than has been fixed for the Calcutta General Hospital.

I am, &c.

(True Copy,)
*(Signed)* J. HUTCHINSON,
*Secretary to the Medical Board.*

# No. 72.

To THE HONBLE. SIR J. P. GRANT,

*Chairman Fever Hospital and Municipal Committee.*

No. 774.

SIR,

I am directed by the Military Board to acknowledge the receipt of your letter of the 5th instant, and to transmit a Statement exhibiting the mean daily number of patients in the General Hospital for the last six years. Should the daily details be required, the Diet Rolls, &c. for the period, about 300 in number, will be collected, and placed at your disposal.

I have the honour to be,

Sir,

Your most obedient servant,

H. DEBUDE,

*Officiating Secretary Military Board.*

COMMISSARIAT DEPARTMENT,

FORT WILLIAM, MILITARY BOARD OFFICE,

*December 7th*, 1838.

# No. 72. (A)

*Patients in the General Hospital for Six Years.*

| Months. | 1832-33. | 1833-34. | 1834-35. | 1835-36. | 1836-37. | 1837-38. | Remarks. |
|---|---|---|---|---|---|---|---|
| | No. & days. | No. & days. | No. & days. | No. & days. | No. & days. | No. & days. | |
| May, .. .. | 1742 | 2489 | 3332 | 1757 | 951 | 818 | |
| June, .. .. | 2155 | 2990 | 3161 | 1691 | 1145 | 729 | |
| July, .. .. | 2374 | 3659 | 3734 | 2066 | 1309 | 798 | |
| August, .. | 2698 | 4363 | 3819 | 2181 | 1152 | 972 | |
| September, .. | 3017 | 4758 | 3918 | 2040 | 1084 | 1037 | |
| October, .. | 3090 | 4331 | 4252 | 2195 | 1027 | 892 | |
| November, .. | 3643 | 4556 | 5199 | 3785 | 1771 | 1024 | |
| December, .. | 3960 | 4348 | 4874 | 1792 | 2566 | 2538 | |
| January, .. | 2829 | 3601 | 3368 | 1358 | 2070 | 2307 | |
| February, .. | 2212 | 2255 | 2557 | 1172 | 1502 | 919 | |
| March, .. .. | 2854 | 2643 | 2305 | 1311 | 1025 | 801 | |
| April, . .. | 2845 | 3034 | 1955 | 970 | 853 | 766 | |
| Total, | 33,419 | 43,027 | 42,474 | 22,318 | 16,455 | 13,601 | Total Number & days 171,294 |
| Average Patients | $91\frac{1}{2}$ | $117\frac{3}{4}$ | $116\frac{3}{4}$ | 61 | 45 | $37\frac{1}{4}$ | General Average Patients $78\frac{1}{4}$ |

H. DEBUDE,

*Officiating Secretary Military Board.*

FORT WILLIAM, MILITARY BOARD OFFICE,

*December 7th*, 1838.

# No. 73.

## To THE HONBLE. SIR J. P. GRANT.

DEAR SIR,

In reference to the inquiry now going on respecting the economick management of Military Hospitals, I beg to bring to your notice certain memoranda, which, if I mistake not, may lead to important inquiry and result. From these documents it would appear, that the average cost, during five years, of merely feeding the sick in Hospital, is Co's. Rs. 8 : 0 : 2 $\frac{2}{5}$, while a like average for feeding sound men on duty is, above Allahabad, Co's. Rs. 5 : 10 : 2 $\frac{3}{5}$, and below that Station, Co's. Rs. 4 : 6 : 4 $\frac{4}{5}$. It thus appears that above Allahabad, the aggregate of the ration for a man in health, and of the Hospital stoppage, will little more than feed a man in sickness, while below the Station mentioned, that aggregate just about covers the cost of dieting a sick man.

My letter of the 3rd ultimo will have made you acquainted with the practical working of the simple and admirable system of Hospital economy introduced into the British Army Medical Department by the late Deputy Inspector-General, Dr. Robert Jackson, the principle of which was, that the "sum of money which feeds a soldier in barracks is sufficient to feed him, and furnish him with necessary comforts in Hospital," so as to cause "no expense to the State, beyond the salary of Medical officers, medicines, lodging, and some extra equipment in furniture." You will view with some degree of surprise, then, a statement which goes to shew, that in the East Indies, where the necessaries of life are comparatively much cheaper than in the Western Colonies, the direct contrary occurs to that which has elsewhere been proved by long experience to hold. What may be the result of a further scrutiny into this subject, I cannot pretend to anticipate; but there is, on the face of the statement, a powerful inducement for a searching investigation into a state of things, which implies a considerable sacrifice of the publick funds. The Committee has already been informed directly from the executive heads of the Medical Department of the Bengal Presidency that "the Medical Board is to a very limited extent a board of account;" indeed, nothing of a financial or statistical nature, relating to Hospitals, has been procured from that source. It necessarily follows from this state of things, that the whole of the service is kept equally unacquainted with the Hospital statistics, whether Medical or financial, though nevertheless each individual in it may have, or actually has, the ordering of an Hospital, Military or Civil. Here, Medical officers have nothing to do with Hospital accounts; but it is important not only that they should have a knowledge of them, but that the Medical and Commissariat reckonings be framed on the same basis, so as to form a check upon each other. It is impossible to view the present state of things, so different from what holds in every other British possession, without regret. It is throughout, and so far as I can perceive its tendency, a system calculated to obviate real check; one that renders financial inquiry difficult, if not impossible, and thereby opens a door, to say the least of it, to suspicion of very extensive loss to the State; it is, in short, a plan well calculated to keep every person concerned in ignorance of that which all persons ought to be well informed respecting. I think the most superficial examination of these memoranda, coupled with what is known to prevail in other countries, (where Dr. Jackson's system has worked beyond the expectations of the author) will lead inevitably to this conclusion. I beg to remark, that in none of these statements are European, country medicines, or leeches included.

In the office of the Military Board will be found confirmation or correction of the accompanying memoranda, and it might be well to ascertain officially from that body—

1st. The cost for two years on account of dieting the sick in Hospital of the European corps, in Garrison of Fort William.

2nd. The amount for the same period for European and bazar medicines, and leeches.

3rd. Rate of Hospital stoppage for each Military grade.

4th. Cost per day of ration for a soldier in Barracks.

5th. Cost per day for dieting a soldier in Hospital.

6th. Actual total cost for treating a soldier in Hospital, deducting the amount for ration in health, and Hospital stoppage

7th. Totals, exhibiting the excess per annum on account of treating the European sick of the Bengal Presidency.

Lastly, it would be interesting to have a copy of a report drawn up four or five years ago by the Military Board on the general financial management of Military Hospitals

Dear Sir,

Yours truly

J. R. MARTIN

NATIVE HOSPITAL,
*January 15th*, 1839

## No. 75. (A)

*Memoranda shewing,*

The amount per month of Hospital stoppages of European soldiers of all grades, and in all situations.

- Non-Commissioned, &c . . . . . 3 annas per day.
- Privates and Farriers . . . . 2 annas per day
- which gives per month of $30\frac{21}{18}$ days
- Co's. Rs . . . . . . 5 11 3
- and . . . . . 3 12 10

*Amount of Hospital Stoppages for the following years*:—

| | | | | |
|---|---|---|---|---|
| For 1834-5 | . . | 40,939 | 7 | 4 |
| „ 1835-6, | . . | 43,435 | 2 | 5 |
| „ 1836-7 | . . | 43,143 | 5 | 2 |
| „ 1837-8, | . . | 42,295 | 5 | 1 |
| Total, | . . Co's. Rs. | 1,69,813 | 4 | 0 |

The average cost per month for each year for the last five years feeding the European sick in Hospital.

| | | | | |
|---|---|---|---|---|
| 1833-4, | . . . . Co's. Rs. | 8 | 14 | $0\frac{1}{2}$ |
| 1834-5, | . . . . . . . . | 8 | 10 | $10\frac{3}{4}$ |
| 1835-6, | . . . . . . . . | 8 | 5 | $10\frac{3}{4}$ |
| 1836-7, | . . . . . . . . | 7 | 5 | $6\frac{1}{4}$ |
| 1837-8, | . . . . . . . . | 6 | 12 | $7\frac{3}{4}$ |

*Allahabad—*

And the average in the like manner of the cost of feeding European soldiers, in Barracks, or *not* in Hospital, .. .. . ..

| | | above | | | below. | | |
|---|---|---|---|---|---|---|---|
| 1833-4, | .. | 6 | 3 | 9 | 4 | 8 | 3 |
| 1834-5 | .. | 5 | 12 | 2¼ | 4 | 6 | 0 |
| 1835-6, | .. | 5 | 3 | 4 | 4 | 12 | 3 |
| 1836-7, | .. | 5 | 4 | 6 | 4 | 2 | 2 |
| 1837-8. | .. | 5 | 11 | 4¼ | 4 | 3 | 4 |

These averages do not include the cost of superintendence, that is, the salaries of fixed establishments, as of the Commissariat, General, &c. &c.

The dieting of the European sick amounts to something very near 3½ laks of Rupees per annum:—

Rates for 1828-29.

| | | | | |
|---|---|---|---|---|
| For Diet articles, . | .. | 6 | 9 | 1¼ |
| ,, Wines and Liquors, | .. | 4 | 4 | 7¼ |
| ,, Establishments, .. | .. | 9 | 15 | 1¼ |
| ,, Clothing and necessaries | .. | 4 | 0 | 8¼ |
| ,, Contingencies, .. | . | 1 | 0 | 8 |
| | Sa. Rs. | 22 | 14 | 8¼ |

| | |
|---|---|
| Commissariat charge, .. .. .. .. .. | Sa. Rs. 4 28 450 |
| Would have been under the former contract system .. .. | 5 45 041 |
| | 1 16 591 |

*Dieting sick, number daily in Hospital.*

| | | Expense as yet ascertained. |
|---|---|---|
| 1833-4 .. .. . | 1175¼ .. .. .. .. | 3,83,977 |
| 1834-5 .. .. . . .. | 1103¾ .. .. .. .. | 3,92,807 |
| 1835-6 .. . . | 1023¼ .. .. .. .. | 3,66,520 |
| 1836-7 .. .. .. .. | 1055¼ .. .. .. . | 3,38,530 |
| 1837-8 .. .. .. | 1061¾ .. .. .. .. | *3,16,917 |
| | 5419¼ at Rs. 27 : 10 : 6 per Rs. | 17,98,751 |
| | add Commissariat superintendence at 5 per cent, | 89,937 |
| | General average 29 : 0 : 11 | 18,89,688 |

The Government charge is a rupee a day, which the above will come to, not including Buildings, &c.

*Not included.*—Buildings—Furniture—Pay, &c. of Medical Commissioned Officers

* Forthcoming arrear not added

## 1836-37.

| | Patients. | Diet & Wine. | | | Servants. | | | Clothing and Contingencies. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| May, .. .. .. .. | 2788 | 456 | 5 | 11 | 597 | 4 | 4 | 62 | 1 | 2½ | 44th Regiment. |
| June .. .. .. .. | 2401 | 417 | 10 | 8 | 591 | 12 | 0 | 68 | 15 | 1½ | |
| July, .. .. .. | 2326 | 432 | 5 | 7 | 590 | 8 | 0 | 55 | 2 | 9½ | |
| August, .. .. | 2868 | 569 | 9 | 4 | 590 | 8 | 0 | 928 | 15 | 2½ | |
| September, .. .. .. | 2740 | 563 | 3 | 5¼ | 584 | 8 | 0 | 45 | 1 | 1½ | |
| October, .. .. .. | 2741 | 559 | 7 | 10 | 590 | 8 | 0 | 76 | 11 | 8½ | |
| November, .. .. .. | 2368 | 467 | 0 | 5 | 601 | 13 | 10 | 44 | 13 | 1½ | |
| December, .. .. .. | 2344 | 458 | 15 | 2¼ | 590 | 8 | 0 | 828 | 9 | 5½ | |
| January, .. . | 2344 | 458 | 15 | 2¼ | 590 | 8 | 0 | 54 | 8 | 10½ | |
| February .. .. .. | 1194 | 216 | 7 | 5 | 571 | 14 | 10 | 51 | 8 | 10½ | 26th Foot |
| March .. . .. .. | 1322 | 226 | 2 | 6 | 540 | 6 | 5 | 53 | 6 | 7½ | |
| April .. . | 1646 | 275 | 15 | 3¼ | 554 | 10 | 1 | 74 | 3 | 1½ | |
| | 27,082 | 5102 | 2 | 11 | 6997 | 13 | 9 | 2347 | 4 | 3 | |

In January Her Majesty's 26th relieved Her Majesty's 44th, which caused a confusion of expenses. For the sake of greater uniformity therefore the aggregate of December has also been taken for January.

## 1837-38.

| | Patients | Diet & Wine | | | Servants. | | | Clothing and Contingencies. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| May, .. .. .. | 2054 | 365 | 1 | 5¼ | 642 | 0 | 0 | 211 | 9 | 10 | 26th Foot |
| June, .. .. .. . | 2474 | 424 | 9 | 0¼ | 657 | 8 | 0 | 94 | 10 | 8 | |
| July, .. .. .. | 2865 | 520 | 9 | 7 | 633 | 0 | 0 | 83 | 15 | 10 | |
| August, .. .. | 3103 | 588 | 0 | 6 | 648 | 7 | 0 | 60 | 0 | 7 | |
| September, .. .. .. | 2546 | 498 | 3 | 7 | 588 | 0 | 0 | 1503 | 1 | 5 | |
| October, .. .. | 2479 | 506 | 11 | 6 | 773 | 2 | 8 | 52 | 0 | 4 | |
| November, .. .. | 2117 | 433 | 4 | 11 | 593 | 8 | 0 | 71 | 13 | 10½ | |
| December, . .. .. | 1976 | 385 | 7 | 0 | 577 | 8 | 0 | 61 | 15 | 10½ | |
| January, .. .. .. | 1461 | 272 | 1 | 5½ | 577 | 8 | 0 | 54 | 11 | 4½ | |
| February, .. . .. .. | 1339 | 234 | 9 | 8 | 577 | 8 | 0 | 51 | 0 | 4½ | |
| March, .. .. .. | 1492 | 266 | 7 | 2¼ | 577 | 8 | 0 | 49 | 7 | 7½ | |
| April, .. .. .. | 1936 | 394 | 10 | 4 | 611 | 12 | 0 | 57 | 9 | 1½ | |
| 1837-38. | 25,842 | 4889 | 12 | 3¼ | 7457 | 5 | 8 | 2352 | 1 | 2½ | |
| 1836-37. | 27,082 | 5102 | 2 | 11 | 6997 | 13 | 9 | 2347 | 4 | 3 | |
| | 52,924 | 9991 | 15 | 2¼ | 14,455 | 3 | 5 | 4699 | 5 | 4 | |

Average 72½ Patients at 16 : 12 : 0¼ each per month 29,146 7 11¾

# No. 74.

TO THE HONBLE. SIR J. P. GRANT.

DEAR SIR,

With a view to ascertain the influence of season on health, I have prepared the following Table from a document furnished by the Medical Board. It exhibits the totals of admissions and deaths in the Presidency General Hospital in each month during twelve years. The item " other diseases" has some awkwardness in it, but that I cannot help.

Yours truly,

J. R MARTIN

| Range of observations in months | Total Admissions. | | | | | Total Deaths | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | By acute diseases. | By chronic diseases | By surgical diseases. | By " other diseases." | By all diseases. | By acute diseases. | By chronic diseases. | By surgical diseases. | By " other diseases." | By all diseases. |
| In 12 Januarys. .. .. .. .. | 899 | 64 | 261 | 245 | 1 469 | 89 | 10 | 5 | 8 | 112 |
| ,, 12 Februarys. .. .. .. .. | 557 | 46 | 185 | 250 | 938 | 67 | 6 | 2 | 13 | 88 |
| ,, 12 Marchs. .. .. .. .. | 456 | 38 | 163 | 132 | 789 | 55 | 5 | 5 | 7 | 72 |
| ,, 12 Aprils, .. .. .. .. | 619 | 42 | 138 | 175 | 974 | 50 | 6 | 6 | 12 | 74 |
| ,, 12 Mays. .. .. .. .. | 722 | 70 | 161 | 178 | 1,131 | 67 | 11 | 7 | 12 | 97 |
| ,, 12 Junes. .. .. .. .. | 791 | 63 | 184 | 186 | 1,224 | 64 | 4 | 4 | 11 | 83 |
| ,, 12 Julys. .. .. .. .. | 843 | 38 | 176 | 127 | 1,184 | 104 | 6 | 11 | 24 | 145 |
| ,, 12 Augusts. .. .. .. .. | 732 | 42 | 180 | 146 | 1,100 | 88 | 9 | 9 | 8 | 114 |
| ,, 12 Septembers. .. .. .. .. | 683 | 69 | 148 | 171 | 1,074 | 112 | 8 | 11 | 13 | 144 |
| ,, 12 Octobers, .. .. .. .. | 764 | 48 | 229 | 182 | 1,223 | 114 | 4 | 10 | 8 | 136 |
| ,, 12 Novembers .. .. .. .. | 1,142 | 120 | 282 | 325 | 1,869 | 97 | 4 | 5 | 10 | 116 |
| ,, 12 Decembers, .. .. .. .. | 948 | 87 | 247 | 233 | 1,515 | 109 | 8 | 7 | 27 | 151 |
| Total .... | 9,156 | 727 | 2,354 | 2,253 | 14,490 | 1,016 | 81 | 82 | 153 | 1,332 |

## REMARKS.

It appears from the Medical Board's Table that out of 1,704 Europeans who died in the 12 years, 372 died of Cholera; 304 of Dysentery; 58 of Diarrhœa; 465 of Remittent Fever; 66 of Intermittent; 50 of Hepatitis; 88 of Phthises, so-called, but more than half were probably Bronchitis; 19 of Rheumatism; 6 only of Spleen; 8 of Apoplexy; 9 of Delerium Tremens; 6 of Smallpox; leaving 270 deaths from "other diseases."

The total admissions in 12 years are 15,293; and the deaths, 1,704.

The proportions of deaths to cases treated are as follow:—

| | |
|---|---|
| Of Remittent fever, 5,116 admissions, and 465 deaths, or one in .. .. .. | 11 |
| " Dysentery, 1,877 admissions, and 304 deaths, or one in ... .. . . | $6\frac{1}{9}$. |
| " Cholera, 803 admissions, and 372 deaths, or one in . . | $2\frac{1}{6}$. |
| " Diarrhœa, 608 admissions, and 58 deaths, or one in .. | $10\frac{1}{2}$ |
| " Intermittent fever, 501 admissions, and 66 deaths, or one in . .. | $7\frac{7}{11}$ |
| " Hepatitis, 446 admissions, and 50 deaths, or one in . . | $8\frac{9}{10}$ |
| " Spleen diseases, 58 admissions, and 6 deaths, or one in .. . | 9 |
| " Delerium Tremens, 124 admissions, and 9 deaths, or one in . . | $13\frac{7}{9}$ |
| " Apoplexy, 27 admissions, and 8 deaths, or one in .. .. .. | $3\frac{3}{8}$ |
| " Other Diseases, 2,253 admissions, and 153 deaths, or one in .. .. . | 11 |

Average of all diseases, nearly one in Nine

From the Table of Seasons as above arranged, it appears that the most healthy months comparatively, are February, March, April, and May; that from June to January the admissions range high. These results correspond nearly with observations on the climate of Jamaica and others of the West Indian Colonies, wherein the most unhealthy, as well as fatal months of the year extend from August to December inclusive; the only months comparatively healthy, being from January to June. These observations would seem to apply to most parts of the Northern hemisphere, which generally possess the same character of climate, at least so far as the health of European troops is concerned. In order that the Table should express only the result of ordinary season and endemick influence, I have not included cholera, which epidemick is found to prevail chiefly in the months of April, May, and June.

October, November, December, and January, are the months in which there occurred the largest proportions of remittent fever cases, and the same applies to dysentery, diarrhœa and acute hepatites; while Septembers alone give more intermittents than the whole of the year besides.

In order to account for the unusual mortality under all heads of disease, it is proper to mention that the descriptions of persons treated in General Hospital, are as follows:—European soldiers belonging to detachments from H. M. and the Honourable Company's Regiments;—Recruits for ditto;—European and American seamen from the shipping;—Townsmen;—Paupers, generally seamen;—invalid soldiers on their way to England, &c. &c:—in short, a class of persons away from that salutary controul which leads to prompt measures both for the prevention and cure of disease. It thus happens, that the earlier stages of acute illness are neglected—an irrecoverable loss—and must frequently imply the necessary loss of life.

It will be observed, that however interesting the results here obtained, they are of no value in the real statistics of disease. We have no where the mean duration of illness; nor the relation of sick time to death; nor any means of comparing the mortality of the sick with that of the total population; nor the influence of age and sex in the production of disease, or on its treatment. These, and many subjects second in importance only to the cure of disease, are altogether wanting, and will continue so, until a better system of record is introduced into our Hospitals, Military and Civil.

I have urged this subject more than once on the Medical authorities, but hitherto without any useful result.

To insure precision and uniformity in reports, the nomenclature of Hospitals is strictly ordered in the Royal Army, and this is one of the many advantages its system possesses over ours.

From the circumstance that no general mode of registering and recording exists, on statistical principles, which all may adopt, the great majority of experience in India perishes with individuals, and the valuable materials of a long and active life are for ever lost to the publick service.

So serious an evil results naturally from the total absence of all organized plans, by which the duty of simplifying and recording facts and individual observation may be facilitated.

The labour of analysing observations which have been irregularly kept is immense—to some men impossible; while by order, a habit of observation is fostered and kept alive, through the increasing facility in the process, and the interest excited by the subject. Such are the opinions of some of the ablest writers on this subject in England.

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## No. 74. (A)

*Aggregate of the Monthly Admissions and Deaths in the Hospital of Her Majesty's Corps in the Garrison of Fort William, from January, 1827, to November, 1838.*

| Range of observations in months. | Total Admissions. By Fevers. | By Hepatitis | By Bowel Complaints. | By other diseases. | Total by all diseases. | Total Deaths. By Fever. | By Hepatitis | By Bowel Complaints. | By other diseases. | Total by all diseases. |
|---|---|---|---|---|---|---|---|---|---|---|
| In 12 Januarys. | 231 | 24 | 249 | 539 | 1,043 | 7 | 3 | 20 | 10 | 40 |
| .. 12 Februarys. | 266 | 51 | 263 | 627 | 1,207 | 1 | 2 | 16 | 5 | 24 |
| .. 12 Marchs. | 323 | 64 | 286 | 606 | 1,279 | 9 | 1 | 16 | 10 | 36 |
| .. 12 Aprils. | 303 | 66 | 318 | 708 | 1,395 | 6 | 2 | 19 | 9 | 36 |
| .. 12 Mays, | 418 | 53 | 330 | 726 | 1,527 | 8 | 2 | 22 | 12 | *44 |
| .. 12 Junes. | 488 | 57 | 253 | 698 | 1 496 | 5 | 2 | 18 | 13 | 38 |
| .. 12 Julys, | 403 | 68 | 314 | 586 | 1,371 | 16 | 5 | 28 | 10 | 59 |
| .. 12 Augusts, | 427 | 38 | 321 | 609 | 1,395 | 18 | 4 | 25 | 8 | 55 |
| .. 12 Septembers. | 446 | 42 | 256 | 557 | 1,301 | 18 | 4 | 30 | 10 | 62 |
| .. 12 Octobers, | 404 | 33 | 250 | 541 | 1,228 | 23 | 0 | 21 | 6 | 50 |
| .. 12 Novembers. | 423 | 39 | 203 | 574 | 1,239 | 19 | 4 | 25 | 9 | 57 |
| .. 11 Decembers | 311 | 20 | 202 | 550 | 1,083 | 16 | 1 | 16 | 10 | 43 |
| Total. | 4,443 | 555 | 3,245 | 7,321 | 15,564 | 146 | 30 | 256 | 112 | 544 |

## REMARKS.

It thus appears, that in the twelve years there were 15,564 admissions by all diseases, and 544 deaths, or one death in every $28\frac{3}{5}$ patients treated, being less by two-thirds than the general average afforded by the General Hospital Returns for the same period—an emphatick example of the value of that internal discipline and economy in corps, to which so much preventive and curative result is ascribed by all military and medical authorities. Out of 544 deaths, 256 are by bowel complaints; 146 by fever; and 30 by liver disease—leaving 112 deaths by other diseases.

The proportions of deaths to cases treated are as follow :—

By fever, 4,443 admissions, and 146 deaths, or one in 30 and $\frac{2}{3}$ nearly ; by bowel complaints, 3,245 admissions, and 256 deaths, or one in $12\frac{1}{2}$ nearly ; by hepatitis, the very large proportion of 555 admissions, and 30 deaths, or one in $18\frac{1}{2}$ , by other diseases, 7,321 admissions, and 112 deaths, or one in 65 and $\frac{1}{3}$ nearly.

In order to exhibit the difference of result in the two Hospitals, I subjoin the following comparative Table

| Diseases. | Ratio of death in the Regimental Hospital. | Ratio of death in the General Hospital. | Difference |
|---|---|---|---|
| Fevers, .. .. | One in $30\frac{2}{3}$ .. | One in $10\frac{3}{5}$ .. | Of 20 nearly .. 6 .. |
| Bowel complaints .. | One in $12\frac{1}{2}$ .. | One in $6\frac{9}{10}$ .. | .. $5\frac{1}{2}$ .. |
| Hepatitis, . .. | One in $18\frac{1}{2}$ . | One in $8\frac{9}{10}$ .. | .. $9\frac{1}{2}$ .. |
| Other diseases, .. | One in $65\frac{1}{3}$ .. | One in $14\frac{2}{3}$ .. | ,, $50\frac{2}{3}$ .. |

Under the head "bowel complaints," it is presumed that cholera, dysentery, and diarrhœa are comprehended This, and the lumping of 7,000 odd cases under the vague designation of "other diseases,' goes considerably to vitiate the Regimental Table; but I am in hopes, in a few weeks, to have both errors corrected, as they arose from misapprehension on the part of the compiler, who is at the distant station of Meerut.

The Table, with all its faults, is not without value, as bearing on the three grand divisions of tropical disease, viz. fevers, bowel diseases, and those of the liver.

(*Signed*) J. R. MARTIN.

## No. 75.

To THE HONBLE. SIR J. P. GRANT,

*Chairman of the Fever Hospital and Municipal Committee, Calcutta*

SIR,

I have to apologize for not having before replied to your letter of the 28th ultimo, which I had the honour to receive the day before yesterday; I am however sorry to inform you, that it is out of my power to furnish you with the information required, the Diet rolls of the numbers to be supplied with provisions in all European Hospitals being invariably forwarded by all Superintending Surgeons to the Secretary to the Military Board in the Commissariat Department, from whom, however, the information required can of course be immediately obtained.

I have the honour to be, Sir
Your most obedient servant,

J. SMITH,
*Officiating Superintending Surgeon, Presidency*

CALCUTTA,
*December 1st*, 1838

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## No. 76.

To THE HONBLE. SIR J. P GRANT,

*Chairman of the Fever Hospital and Municipal Committee.*

No. 948.

SIR,

With reference to your letter of the 17th instant, transmitting certain querie I am directed by the Military Board to forward the same herewith, with the replies annexed, to the extent the Records of their office would admit of.

I have the honour to be, Sir,
Your most obedient servant,

*(Signed)* H. DEBUDE,
*Offic. Secy. Mil. Bd.*

COMMISSARIAT DEPARTMENT,
FORT WILLIAM, MILITARY BOARD OFFICE,
*January 30th*, 1839.

# No. 76. (A)

*Questions to which answers are requested by the Fever Hospital and Municipal Improvements Committee from the*

## SECRETARY TO THE MILITARY BOARD.

*Q.* 1. What has been the cost for the two years past on account of dieting the sick in Hospital, of the European corps in the garrison of Fort William?

| *A.* For 2 years | | | | | ₱ day. | | |
|---|---|---|---|---|---|---|---|
| Dieting, .. .. .. .. | Rupees, 9,991 | 15 | 2¼ | | 0 | 3 | 0¼ |
| Servants, .. .. .. .. | ,, 14,455 | 3 | 5 | | 0 | 4 | 4¼ |
| Clothing and Contingencies, .. .. | ,, 4,699 | 5 | 4¼ | | 0 | 1 | 5¼ |
| | Rupees, 29,146 | 7 | 11¾ | | 0 | 8 | 9¾ |
| | | | | ₱ month, | 16 | 12 | 0¼ |

*Q.* 2. What has been the cost for the same period of European and Bazar medicines, and leeches supplied for the said sick, for the said corps?

*A.* Europe medicines are supplied by the Dispensary, cost unknown; Bazar medicines and leeches amounted to, .. .. .. .. 1,996 8 1

Average per month 1 2 9¼

*Q.* 3. What has been the mean daily number for the same period of the sick in Hospital, in the said corps, in the said garrison?

*A.* 72½, including three apprentices dieted with the patients.

*Q.* 4. What is the rate of Hospital stoppage for each Military grade in the Company's army within the Presidency of Bengal; distinguishing the rate charged for troops stationed above Allahabad, and for troops stationed in districts below it, distinguishing also between the amount of stoppage for Europeans and that for Native troops?

*A.* No information in the Military Board Office; but the Medical Regulations direct as follows, pp. 168-9,—

| | | |
|---|---|---|
| Non-Commissioned Officers each per diem, | .. .. | 3 annas |
| Privates and Farriers, | ditto, .. .. .. .. | 2 ditto. |
| Women, | ditto, .. .. .. .. | 1 ditto. |

No stoppages are directed for Native troops who diet themselves.

*Q.* 5. What is the cost per day of the ration of a soldier in Barracks, distinguishing the rate in stations above and below Allahabad, and distinguishing likewise the cost per day between European and that of Native troops?

| | | | |
|---|---|---|---|
| *A.* Above Allahabad per diem, .. .. .. | 3 | 0 | annas |
| Below ditto, .. .. .. .. .. .. | 2 | 2½ | ditto, |

Native troops are not victualled by the State, except on extraordinary emergencies, as in the Ava and Indus campaigns, when they receive free rations averaging about 3½ rupees per month. Vide G. O. 1824, pp. 512 and 92; the stores being issued by the Commissariat.

Q. 6. What is the cost per day for dieting a soldier in Hospital, distinguishing the stations above and below Allahabad, and distinguishing between Europeans and Natives, as aforesaid ?

*A. Europeans,*

| | | | | |
|---|---|---|---|---|
| Above, Allahabad. | Diet alone in 1837-38 .. .. .. | 3 | $9\frac{1}{4}$ | annas |
| | Ditto including servants, &c. .. .. | 14 | $2\frac{3}{4}$ | ditto, |
| Below, Allahabad. | Diet alone in 1837-38 .. .. .. | 3 | 4 | ditto, |
| | Ditto including servants, &c. .. .. | 11 | $9\frac{1}{2}$ | ditto, |

*Natives,*

These diet themselves.

Q. 7. What is the actual excess in the total cost of treating a soldier in Hospital in the said provinces, distinguishing, as aforesaid, after deducting the amount of the ration in health and the Hospital stoppage ?

*A.* This and the following query can only be partially answered in the Commissariat. The actual total cost per patient per month for diet, servants, clothing, &c. in 1837-38 was for

| | | | |
|---|---|---|---|
| $560\frac{1}{4}$ patients above Allahabad, .. .. .. .. | 27 | 2 | 0 |
| $501\frac{1}{4}$ below ditto, .. .. .. .. .. .. | 22 | 7 | $7\frac{3}{4}$ |
| Bazar medicines, as above, .. .. .. .. .. | 1 | 2 | $9\frac{1}{4}$ |
| Buildings, furniture, &c. estimated at .. .. .. | 5 | 0 | 0 |
| The ration money in health was above Allahabad. .. | 5 | 11 | $4\frac{1}{2}$ |
| Below ditto, .. .. .. .. .. .. .. | 4 | 3 | $4\frac{1}{4}$ |

Q. 8. What is the amount of the total excess per annum, after deducting, as aforesaid, of the cost of treating the sick of the European troops belonging to the Bengal Presidency ?

*A.* The above is all the data that can be furnished, as the following charges are adjusted in other Offices,

Europe medicines and instruments for European corps

Surgeons' pay and allowances of European corps.

Hospital stoppages.

Q. 9. It is understood that a Report was drawn out four or five years ago by the Military Board on the General Financial Management of Military Hospitals, the Committee request to be furnished with a copy of the said Report.

*A.* Furnished herewith, No. 1355 of 30th April, 1831, also extract of No. 482 of the 10th October, 1831.

(*Signed*) H DEBUDE,

*Officiating Secretary Military Board.*

# No. 76. (B)

FROM THE MILITARY BOARD,

To THE HONBLE. SIR C. T. METCALFE, BARONET,

*Vice-President in Council.*

No. 1355.

HONOURABLE SIR, *Dated Fort William, 30th April,* 1831.

We have the honour to acknowledge the receipt of Secretary Colonel Casement's letter, No. 97 of the 4th ultimo, requiring particulars of the total charge exhibited in the Commissariat Accounts of Sicca Rupees 4,28,450 : 4 : 10, incurred for the expenses of sick Europeans in the year 1828-29, arranged under the several heads of Diet, Clothing, Wines and Liquors, Servants, and Contingent charges, shewing the average rate of each per man, monthly, with details of the same particulars as authorized by the Regulations of Government, and noticing such contingencies as may not have been so provided for; shewing also the net outlay or actual cost to Government, after all necessary deductions for Hospital stoppages, &c.

Forwarding de-tails of the Com-missariat Expen-diture for Hospls. No records can be traced respecting Hospl. stoppages.

2d. We have accordingly the honour to submit three Statements, containing the detailed information required, and with reference to the last point to say, that the Records of our Board do not contain any correspondence on the proposed modification of the rates of Hospital stoppages, nor have we any data on which to found any observations on the subject.

We have, &c.

*(Signed)* A. MACLEOD, *Brigadier Comdt.*
A. GALLOWAY, *Lt. Col. M. M. Bd.*
J. CRAIGE, *M. M. Board.*

COMMISSARIAT DEPARTMENT.

## I.

*Satement shewing the proportions of the total sum charged in the Commissariat Department for Dieting and Clothing sick Europeans for the year 1828-29, as expended under the following heads, shewing the average for each man monthly.*

1536¼ *Average No. of patients in Hospital during the year, including Apprentices Women, and Children.*

| | Amount of expenditure under each head. | | | Rate per man monthly. | | |
|---|---|---|---|---|---|---|
| | Sicca Rupees. | | | Sicca Rupees | | |
| Diet Articles, | 1,23,081 | 1 | 1¾ | 6 | 9 | 4¼ |
| Wines and Liquors, | 24,069 | 13 | 7¼ | 1 | 4 | 7¼ |
| Establishments, | 1,86,193 | 14 | 7½ | 9 | 15 | 4¾ |
| Clothing and Necessaries, | 75,613 | 4 | 7¾ | 4 | 0 | 8½ |
| Contingencies of every description, | 19,492 | 2 | 9¾ | 1 | 0 | 8 |
| Total amount charged in the Comt. Sa. Rs. | 4,28,450 | 4 | 10 | 22 | 14 | 8¾ |

The lowest rate per man for the expenditure of wines and liquors occurred in the Hospital at Secrole, Benares, being Rupees 0 : 4 : 6¼ per man. The highest rate occurred at the Landour Convalescent Depôt, being Rupees 7 : 3 : 10 per man. The next highest rate at a *fixed* station occurred at Saugor, being Rupees 4 : 14 : 7¼ per man.

In the two last cases the high charge arises more from the variety and price than the quantity of wine issued, which, except on very extraordinary occasions, has never exceeded the utmost limit sanctioned by Government, namely six dozen for every 20 patients per month.—Vide Medical Code, page 9.

The cases when unusual quantities of wine are issued (though not exceeding the above limitation) are generally explained by Surgeons to be for cases of debility, requiring proportionate nourishment. The documents to this effect are attested on honour, both by the Surgeon and Superintending Surgeon, in the separate declarations provided for that purpose for each.

The Contingent Expenses not provided for in any specifick Regulation, consist of Boat and Hackery-hire for carriage of Hospital stores, tinning cooking utensils, Commissariat establishments for providing Hospital supplies, Stationery, and other petty and occasional demands, all which are subject to the approval and sanction of the Commissary General, and the charges for them are supported by certificates of their necessity from the Medical Officer concerned.

*(Signed)* G. YOUNG,
*Secretary and Accountant Military Board*

FORT WILLIAM MIL. BD. OFFICE,
*30th April*, 1831.

# No. 76. (B)

## II.

*Statement of Establishments authorized for the Hospital of the following Corps—Full Batta Stations.*

| | For a Regt. of European Infantry. | | | For a Regt. of Dragoons. | | | For a Brigade of Horse or a Battalion of Foot Artillery. | | | For more than one and not amounting to four Troops or Companies. | | | For 24 men upwards to one Troop or Company. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | Rate, | Amount, | No. | Rate. | Amount. | No. | Rate. | Amount. | No. | Rate, | Amount, | No. | Rate, | Amount, |
| *Medl. Department* | | | | | | | | | | | | | | | |
| Apothecary, | 1 | 145 | 145 | 1 | 145 | 145 | 1 | 145 | 145 | 0 | 0 | 0 | 0 | 0 | 0 |
| Assist. Apothecary. | 1 | 70 | 70 | 1 | 70 | 70 | 0 | 0 | 0 | 1 | 70 | 70 | 1 | 70 | 70 |
| Apprentices, | 2 | 33 | 66 | 2 | 33 | 66 | 1 | 33 | 33 | 0 | 0 | 0 | 0 | 0 | 0 |
| Head Compounders, | 1 | 10 | 10 | 1 | 10 | 10 | 1 | 10 | 10 | 1 | 10 | 10 | 1 | 10 | 10 |
| Compounders, | 1 | 8 | 8 | 1 | 8 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Head Dresser, | 1 | 8 | 8 | 1 | 8 | 8 | 1 | 8 | 8 | 1 | 8 | 8 | 0 | 0 | 0 |
| Dresser, | 1 | 6 | 6 | 1 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Shop Coolies. | 2 | 5 | 10 | 2 | 5 | 10 | 2 | 5 | 10 | 1 | 5 | 5 | 1 | 5 | 5 |
| *Steward's Department.* | | | | | | | | | | | | | | | |
| Steward, | 1 | 125 | 125 | 1 | 125 | 125 | 1 | 125 | 125 | 0 | 0 | 0 | 0 | 0 | 0 |
| Assist. Steward, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 70 | 70 | 0 | 0 | 0 |
| Apprentices, | 1 | 33 | 33 | 1 | 33 | 33 | 1 | 33 | 33 | 0 | 0 | 0 | 0 | 0 | 0 |
| Native Writers, | 1 | 35 | 35 | 1 | 35 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Steward's Servants, | 2 | 6 | 12 | 2 | 6 | 12 | 2 | 6 | 12 | 1 | 6 | 6 | 0 | 0 | 0 |
| Sirdar Bhistee. | 1 | 6 | 6 | 1 | 6 | 6 | 1 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bhistees. | 6 | 5 | 30 | 4 | 5 | 20 | 3 | 5 | 12 | 2 | 5 | 10 | 1 | 5 | 5 |
| Sirdar Sweeper. | 1 | 6 | 6 | 1 | 6 | 6 | 1 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sweepers. | 8 | 4 | 32 | 6 | 4 | 24 | 4 | 4 | 16 | 2 | 4 | 8 | 1 | 4 | 4 |
| Sirdar Cooly. | 1 | 6 | 6 | 1 | 6 | 6 | 1 | 6 | 6 | 1 | 6 | 6 | 0 | 0 | 0 |
| Coolies, | 20 | 4 | 80 | 12 | 4 | 48 | 6 | 4 | 24 | 0 | 4 | 16 | 2 | 4 | 8 |
| Head Cook. | 1 | 6 | 6 | 1 | 6 | 6 | 1 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cooks. | 4 | 5 | 20 | 3 | 5 | 15 | 2 | 5 | 10 | 1 | 5 | 5 | 1 | 5 | 5 |
| Clothier. | 1 | 6 | 6 | 1 | 6 | 6 | 1 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Head Tailor, | 0 | 0 | 0 | 1 | 8 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tailors, | 2 | 6 | 12 | 2 | 6 | 12 | 1 | 6 | 6 | 1 | 6 | 6 | 1 | 6 | 6 |
| Barbers, | 2 | 6 | 12 | 1 | 5 | 5 | 1 | 5 | 5 | 1 | 5 | 5 | 1 | 5 | 5 |
| Head Washerman, | 1 | 10 | 10 | 1 | 8 | 8 | 1 | 8 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mate Ditto. | 1 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Washerman, | 2 | 8 | 16 | 3 | 6 | 18 | 2 | 6 | 12 | 1 | 8 | 8 | 1 | 8 | 8 |
| Nurses, | 1 | 4 | 4 | 1 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Female Sweepers, | 1 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Comt. Establishment.* | | | | | | | | | | | | | | | |
| Gomastahs, | 1 | 25 | 25 | 1 | 25 | 25 | 1 | 25 | 25 | 0 | 0 | 0 | 0 | 0 | 0 |
| Peons, | 2 | $\frac{4}{8}$ | 9 | 1 | 5 | 5 | 1 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Weighmen, | 1 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coolies, | 1 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

NOTE.—The above allowance includes full batta and full tentage, which must be diminished according to the following proportions at half batta Stations, namely ;—

Warrant Medical servants are entitled to Boat allowance when travelling by water, at the rates following,—

| | *Batta.* | *Tentage.* | *Rs.* |
|---|---|---|---|
| Apothecary & Steward, | 30 | 17½ | 70 |
| Assistant ditto, ditto, | 15 | 7½ | 50 |
| Apprentices, | 2½ | 7½ | The same as a Non-Commissioned Officer |

The Establishments above detailed are *fixed* for the Hospitals above enumerated, and the servants generally of old standing in the service. The Establishments, therefore, undergo no alteration from any increase or decrease of sick. The wages of such as are not defined by any specifick Regulation are regulated according to local usage, distance of situation, and other circumstances which may be urged, under the authority or sanction of Superintending Surgeons. The Native servants required for detachments, and all servants extra to the fixed establishment, who may under any peculiar circumstances be required, are supplied under the written requisitions of Surgeons, countersigned by Superintending Surgeons. When proceeding with detachments such servants are entitled to return here on discharge.

*(Signed)* G. YOUNG,
*Secretary and Accountant Military Board.*

FORT WILLIAM, MILITARY BOARD OFFICE,
*April 30th*, 1831.

# No. 76. (B)

## III.

*Statement exhibiting the amount of Hospital stoppages, with other deductions necessary to be made from the general charge in the Commissariat Department, towards shewing the balance of outlay or expense actually incurred for Dieting and Clothing the European sick for the year* 1828-9.

| | | | | |
|---|---|---|---|---|
| Total amount charged in the Commissariat in 1828-9 .. | | | | Sa. Rs. 4,28.450 4 10 |
| Deduct amount of Hospital stoppages during the year, as per accompanying Statement furnished by the Military Auditor General .. Sonat Rs. | 56,753 12 2 or | | Sa. Rs. 54,307 7 7 | |
| Ditto amount of Provisions or Wet Batta for $636\frac{5}{6}$ men saved at Half Batta Stations by the men being in Hospital, at Sicca Rupees 4 : 2 each per month | | 31.523 4 0 | | |
| Amount of ditto for $899\frac{2}{12}$ men in Hospital, at Full Batta Stations at Rupees 5 : 2 : 2. .. | | Sa. Rs. 55,426 8 10 | 86.949 12 10 | |
| Ditto amount recovered from Non-military patients in the General Hospital at the Presidency. | | | 5,528 6 6 | |
| Do. for sale of condemned Hospital stores. .. | | | 191 3 3 | 1,47,876 14 2 |
| Net outlay, or actual charge, | | | Sicca Rupees.. | 2,80,573 6 8 |

Which gives an average on $1536\frac{1}{4}$ patients of Rupees 15 : 3 : 8 per man per month.

Were the Regimental or dry Batta of Rs. 5 at half, and Rs. 10 per man per month at Full Batta Stations deducted from the general charge, instead of the rate at which the Commissariat provisions were issued, it would cause a further diminution of the general charge by Sa. Rs. 52,891 : 1 : 0, and reduce the average per patient to Rs. 12 : 5 : 9 per month.

The tables of Diet, and details of Clothing, which the sick are entitled to receive in Hospital, and lists of Establishments for Hospitals, Corps, and Detachments, are exhibited in pages 3, 4, and 5 of the Code of Regulations for the Medical Department, from which the deviations have been slight, and provided for in General Orders of 14th and 23rd November, 1822. All articles supplied in excess to the Diet tables referred to, are issued on the requisitions of Surgeons and Superintending Surgeons, and their necessity for the purposes required is attested on honour by both officers respectively.

New clothing is issued on the usual indents, countersigned by Superintending Surgeons, and Survey Reports condemning the old, with account sales of the latter, the net proceeds being deducted from the total charge.

(*Signed*) G. YOUNG,
*Secretary and Accountant, Military Board.*

FORT WILLIAM MIL. BOARD OFFICE,
*30th April*, 1831.

## No. 76. (B)

## III.

*Statement of Hospital Stoppages from European Soldiers, credited in the accounts of the several Paymasters for the year 1828-29.*

| European Corps. | Month of May, 1828. | June. | July. | August. | September | October. | November. | December. | 1829 January. | February. | March. | April. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sa. Rs. | Sa. Rs. | Sa. Rs. | Sa. Rs. | Sa Rs. | Sa. Rs. | Sa. Rs. | Sa. Rs. | Sa. Rs. | Sa. Rs. | Sa. Rs. | Sa. Rs. | Sa. Rs. |
| 1st Brig. Horse Artily. | 106 13 0 | 110 12 0 | 145 3 0 | 170 11 0 | 93 14 0 | 117 8 0 | 134 11 0 | 106 5 0 | 98 6 0 | 48 14 0 | 78 4 0 | 101 8 0 | 1252 13 0 |
| 2d do. do. do. | 117 8 0 | 89 12 0 | 30 15 0 | 101 4 6 | 78 4 0 | 87 7 6 | 71 13 0 | 113 11 6 | 71 3 0 | 73 4 0 | 72 0 6 | 89 13 0 | 1047 3 0 |
| 3d do. do. do. | 116 4 0 | 38 13 0 | 93 14 6 | 96 11 6 | 62 0 0 | 67 0 0 | 63 10 6 | 59 15 6 | 40 6 0 | 52 7 0 | 69 2 0 | 66 5 6 | 826 9 6 |
| 1st Bat. Foot Artily. | 109 9 6 | 117 3 0 | 117 4 6 | 102 12 0 | 105 9 0 | 98 11 6 | 92 12 6 | 71 5 6 | 80 8 6 | 78 5 6 | 95 15 0 | 103 15 0 | 1173 13 6 |
| 2d do. do. do. | 158 2 6 | 143 1 0 | 220 15 6 | 227 15 6 | 191 15 0 | 217 9 6 | 203 0 0 | 175 5 0 | 146 6 0 | 153 4 6 | 150 10 0 | 141 9 6 | 2142 11 0 |
| 3d do. do. do. | 172 8 6 | 190 4 6 | 204 2 0 | 204 7 6 | 237 10 6 | 346 13 0 | 179 11 0 | 151 2 6 | 91 12 0 | 117 9 0 | 113 0 0 | 138 1 6 | 2147 2 0 |
| 4th do. do. do. | 167 8 0 | 206 11 4 | 233 11 6 | 328 10 6 | 346 0 6 | 244 5 6 | 162 13 0 | 135 2 8 | 138 13 6 | 79 3 6 | 119 5 9 | 193 5 6 | 2355 11 3 |
| 5th do. do. do. | 234 5 0 | 220 8 0 | 254 5 6 | 309 15 6 | 319 14 6 | 319 0 0 | 236 1 6 | 180 15 6 | 157 15 6 | 129 12 0 | 145 5 6 | 223 13 6 | 2762 0 0 |
| Non-Commissioned Officers unattached, and Invalids, .. | 11 0 0 | 53 8 0 | 13 2 2 | 333 2 0 | 15 13 0 | 20 5 0 | 39 10 0 | 48 10 0 | 21 2 0 | 53 13 3 | 167 1 0 | 58 9 0 | 863 11 5 |
| 1st European Regt. | 203 9 0 | 210 10 0 | 217 6 0 | 220 13 0 | 196 6 0 | 119 14 0 | 133 6 0 | 102 11 0 | 100 7 0 | 92 11 0 | 118 14 0 | 154 0 0 | 1870 11 0 |
| 2d do. do. | 189 2 6 | 186 10 0 | 186 10 0 | 196 13 0 | 194 6 0 | 92 15 0 | 110 0 0 | 189 13 0 | 108 14 0 | 117 7 0 | 123 0 0 | 181 10 0 | 1895 15 6 |

No. 76. (B)

III

*Statement of Hospital Stoppages from European Soldiers, credited in the accounts of the several Paymasters for the year* 1828-29. (Continued.)

| European Corps. | Month of March, 1828. | June. | July. | August. | September | October. | November. | December. | 1829 January. | February. | March | April. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M. 11th Dragoons, | 204 6 0 | 258 1 0 | 242 0 0 | 210 8 0 | 22[illegible] 0 0 | 266 0 0 | 317 7 0 | 196 0 0 | 195 12 0 | 212 11 0 | 195 7 0 | 196 4 0 | 2723 6 0 |
| „ 16th Lancers, | 206 11 0 | 232 15 0 | 224 13 0 | 211 0 0 | 197 11 0 | 210 4 0 | 209 13 0 | 153 10 0 | 149 0 0 | 149 8 0 | 183 13 0 | 206 4 0 | 2340 6 0 |
| „ 3d Foot or Buffs, | 377 3 0 | 377 3 0 | 377 3 6 | 377 3 6 | 299 12 0 | 276 0 0 | 238 8 0 | 235 1 0 | 264 5 0 | 316 15 0 | 375 6 0 | 390 9 0 | 3905 5 0 |
| „ 13th Ditto. | 430 10 0 | 416 6 0 | 322 10 0 | 305 3 0 | 305 4 0 | 262 5 0 | 245 5 0 | 287 15 0 | 441 15 0 | 432 9 0 | 474 8 0 | 400 5 0 | 4324 15 0 |
| „ 14th Ditto. | 233 11 0 | 305 7 0 | 337 6 0 | 351 5 0 | 348 5 0 | 348 5 0 | 312 15 0 | 306 9 0 | 291 4 0 | 236 2 0 | 420 4 0 | 421 7 0 | 3913 1 0 |
| „ 16th Ditto. | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 265 8 0 | 561 5 0 | 585 13 0 | 1412 10 0 |
| „ 31st Ditto. | 436 14 0 | 410 12 0 | 428 6 0 | 380 7 0 | 413 13 0 | 343 2 0 | 269 7 0 | 269 7 0 | 283 3 0 | 238 13 0 | 349 4 0 | 426 1 0 | 4285 10 0 |
| „ 38th Ditto. | 278 7 0 | 334 0 0 | 368 6 0 | 465 13 0 | 512 13 0 | 519 2 0 | 374 11 0 | 374 11 0 | 295 0 0 | 270 0 0 | 258 11 0 | 301 8 0 | 4293 12 0 |
| „ 44th Ditto. | 339 12 0 | 348 3 0 | 348 0 0 | 299 14 0 | 325 13 0 | 380 3 0 | 207 0 0 | 207 0 0 | 225 13 0 | 234 13 0 | 243 0 0 | 329 15 0 | 3676 10 0 |
| „ 47th Ditto. | 405 1 0 | 436 1 0 | 444 13 0 | 492 11 0 | 479 11 0 | 470 3 0 | 370 3 0 | 370 3 0 | 345 8 0 | 0 0 0 | 0 0 0 | 0 0 0 | 3705 1 0 |
| „ 49th Ditto. | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 204 13 0 | 169 7 0 | 284 0 0 | 379 1 0 | 1137 5 0 |
| „ 59th Ditto. | 351 3 0 | 386 0 0 | 291 4 0 | 303 13 0 | 194 9 0 | 148 15 0 | 188 14 0 | 188 14 0 | 133 10 0 | 21 10 0 | 0 0 0 | 0 0 0 | 2180 8 0 |
| Chinsurah Depôt, | 35 6 0 | 24 12 0 | 131 12 0 | 68 1 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 53 10 0 | 0 0 0 | 516 12 0 |

MEMO. *Rates of Hospital stoppages authorized by Government:—*

Serjeants, Corporals, Bombardiers, Trumpeters, and Drummers, 3 Sonat As per diem.
Gunners, Farriers, and Privates, .. .. .. .. 2 „ „
Women and Children. .. .... .. .. 1 „ „

(*Signed*) J. A. P. MACGREGOR, *Col.*
*Military Auditor General.*

FORT WILLIAM,
My. AUDR. GENL'S. OFFICE,
26*th April*, 1831.

# No. 76. (c)

*Extract of a Letter, No. 482, from*

THE MILITARY BOARD.

To THE HONBLE. THE VICE-PRESIDENT IN COUNCIL.

*Dated* 10*th October*, 1831.

**Para.** 9. Statement No. 3, it will be observed, exhibits the exact amount of the expense of dieting the sick in Hospital. A further detail was called for, and furnished with our letter No. 1353, of the 30th April last, which, along with the charge for Diet, shews also the average rate of Establishments, Clothing, and Contingent charges for carriage, &c. which particulars are not contained in the statements forwarded with our annual Report, in consequence of the charge for Establishments being fixed in its nature, and the regulation of it not being vested in the Commissariat. It continues the same, whether the patients in Hospital be few or many, and consequently as those charges are permanent, the cost to the State of maintaining the sick in Hospital will be inversely as their number, the charges per man will be higher as the number of men decrease. The charges for Clothing and Contingencies fluctuate, and are different in different years, and at different stations, as well as with different corps. For these reasons both items of expense have always been excluded from the average statement. The additional details, however, furnished with our letter above adverted to, were as follow :—

| | | | |
|---|---|---|---|
| For Diet articles, .. .. .. | 6 | 9 | $4\frac{1}{4}$ |
| ,, Wines and Liquors, .. .. .. | 1 | 4 | $7\frac{1}{2}$ |
| ,, Establishments, .. .. .. | 9 | 15 | $4\frac{3}{4}$ |
| ,, Clothing and necessaries, .. .. .. | 4 | 0 | $8\frac{1}{2}$ |
| ,, Contingencies, .. .. .. | 1 | 0 | 8 |
| Sicca Rupees | 22 | 11 | $8\frac{3}{4}$ |

10. This aggregate charge reduced by the amount of Hospital stoppages brought to account by Paymasters, and the saving in rations, and sums realized by the sale of old clothing and stores, also sums recovered from such Non-military patients in the General Hospital as were able to pay (paupers being still included in the general rate) amounted in our comparative statement which accompanied that letter, to Sa. Rs. 15: 3: 8 per man, as the net charge to the State, including every expense except that of Buildings, Medicines, and Surgical aid.

11. During the system of contract with Surgeons, the charge authorized for dieting and necessaries to the sick in the General Hospital was 30 Sonat Rupees per man per month, agreeably to which rate the payments made by Non-military patients (not being paupers) still continue to be brought to the credit of Government

12. Under the same system, Surgeons of all European Regiments and Corps were authorized to draw $17\frac{1}{4}$ Sonat pie per man per diem for the whole number mustered, and also the batta of the sick under their care. This would give for the total number of men

victualled and dieted by the Commissariat in 1828-9, being in the absence of any other the most correct datum of the mustered strength of the European army,

| | | | |
|---|---|---|---|
| Non-commissioned Officers and Privates at $17\frac{1}{4}$ pie at, | 4,31,873 | 1 | $6\frac{3}{4}$ |
| Add proportion by estimate of officers mustered, .. | 14,428 | 14 | 6 |
| Batta of the sick, full or half, according to situation, .. | 1,23,291 | 1 | 6 |
| Total, Sonat Rs. | 5,69,593 | 1 | $6\frac{3}{4}$ |
| or | | | |
| Sa. Rs. | 5,45,041 | 10 | 2 |

But the Commissariat charge, undiminished by any of the savings above adverted to, was, .. . .. .. 4,28,450 4 10

Shewing a saving on this head by the Commissariat of Sa. Rs. 1,16,591 5 4

13. A disparity of rate, to the extent of four-fold, is adverted to in Colonel Casement's letter, between the dieting of the sick and victualling of the men in health. On this point we beg to state, that as respects the charges for supplying articles of consumption, the only item in the two cases susceptible of accurate comparison, it will be observed by statements No. 3 of our annual Report that the victualling or full batta of an European soldier costs Sicca Rupees, .. .. .. .. 6 0 $1\frac{1}{4}$

By statement No. 3, which accompanied our letter No. 1355 of the 30th April last, it appears that the average cost of the diet articles furnished for him while sick, including expensive articles of food, such as milk, puddings, custards, lemonade, whey, and barley-water for drinks, was .. 6 9 $4\frac{1}{4}$

Excess in the charge for diet, .. .. .. .. 0 9 3

14. As respects reduction in this branch of expenditure, the several articles of *diet* and wine issued to the sick being vouched by declarations on honour, the Establishments being *fixed* by the Regulations of Government, and the clothing issued on prescribed indents, approved and countersigned by the Superintending Surgeons, we are not aware that these particular heads of expense can be diminished, unless by a revisal of the Hospital Regulations that object could be attained

(True Copy and Extract,)

H. DEBUDE,

*Offg. Secretary Military Board.*

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## No. 77.

To THE HONBLE. SIR J. P. GRANT.

DEAR SIR,

With respect to your inquiries of to-day, I beg to state that considerable elevation above the level of the soil, airiness, lateral space, and loftiness of Wards, and open space around the buildings, are all no less necessary to a Surgical than to a Medical Hospital. Dr. Hennen, one of the first Military Surgeons of this or any age, complained of an Hospital at Abrantes, where the "low, flat, moist olive-ground, occasionally overflowed by the river," caused a stagnation of the air, especially in the morning, when the whole locality was "enveloped in a dense fog," which, in addition to fevers of the remittent types, caused extreme unhealthiness in all the wounds, frequently terminating in Hospital gangrene.

The same untoward results he observed in Brussels after the battle of Waterloo, where the soldiers occupying the "Petit Chateau," situated among the stagnant waters and the filth of the town, afforded all the most troublesome cases both of intermittent fever and those of a typhoid type, both seriously aggravating the cure of wounds.

NATIVE HOSPITAL,
*February 19th*, 1839.

Yours very truly,
J. R. MARTIN.

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## No. 78.

*Extract of a letter from*

DR. BELL,

*Surgeon of Her Majesty's 26th Regiment, Cameronians.*

To LIEUT. COL. JAMES,

*Commanding Cameronians.*

*General Hospital*, 23*rd February*, 1838.

I beg leave to bring to your notice the present state of the Regimental Hospital, and the great inconvenience suffered by the patients during the hot weather, which is now fast approaching, from the want of a verandah at the ends and on the north side similar to that on the south side of the building; and I hope you will have the goodness to bring the matter to the favourable consideration of the Honourable the Deputy Governour, with your recommendation, that the above deficiencies may be supplied with as little delay as possible.

Before proceeding to state the peculiar inconveniences alluded to, it is right to explain, that the state of the Hospital has for years past been the subject of complaint, both to the authorities here and at home; and in consequence of a communication from the latter, the building has again been examined both by Officers of Engineers and by the Members of the Medical Board, and all have agreed respecting the necessity of the verandah being carried all round the Hospital before it can be made fit for the accommodation of European soldiers. Respecting the correctness of that opinion, few will be disposed to doubt, after a careful consideration of the following circumstances.—

1st. The sun shines into the east end of the Ward for several hours in the morning, and into the west end during the hottest part of the day, covering an extent of several beds in each row, and the only defence against this terrible inconvenience is to shut the venetians and glass windows, by which the heat is very partially, and the fresh air totally, excluded. The disadvantages of such an alternative in a crowded Hospital can easily be understood. For a considerable period before the setting in of the last rains the thermometer never fell below 90°.

2nd. Every shower of rain that does not come directly from the south beats in upon the patients, unless the above suffocating measure of shutting both the venetians and glass windows be had recourse to.

3rd. During the rains the patients have no place to walk in but the southern verandah, which is scarcely ever available for that purpose.

4th. The greatest inconvenience of all remains to be stated. The evacuations of all men under active treatment for dysentery, colic, and cholera, fever, or liver complaint, in short for all abdominal and almost all other diseases, require to be kept for inspection, and there is no place for this purpose but the south verandah, which during the prevalence of southerly breezes forms a nuisance that need not be described. In other Hospitals this is of course easily avoided by keeping the utensils in the leeward verandah, which leaves the others free for the patients to take exercise in.

It is a very remarkable circumstance that this is the only Hospital in India in which I have done duty, or to the best of my recollection ever seen, without a verandah all round it, and the only feasible explanation of the matter is, that this being one of the oldest Hospitals in India has continued to be one of the worst.

5th. One of the most important deficiencies in the present Hospital is the want of one or two separate rooms for the treatment of delirious, noisy, or dying patients, so that a whole Ward is kept in a state of disturbance by one such person. Now by the erection of a very short verandah on the north side, four such rooms would be made available as can easily be explained on the spot.

(A true Extract)

DON. MACLEOD,
*Inspector General.*

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## No. 79.

### QUESTIONS PUT TO DOCTOR D. MACLEOD,

*Inspector General of Her Majesty's Hospitals in India, by the Committee on the Fever Hospital and Municipal Improvements of Calcutta.*

Q. 1. You have stated in your replies to the queries put to you by the members of the Third Sub-Committee, that you are well acquainted with the Hospitals and Dispensaries of London, Dublin, Edinburgh, and several other large Towns in Great Britain and Ireland, and have passed a considerable time in France, particularly in Paris, where more attention is paid to the manner of conducting Hospitals and other Institutions for the cure and relief of disease than in any other country in Europe.

Have you also in the course of your Military and professional life visited the British colonies in the West Indies, and are you acquainted with the mode of conducting the Military Hospitals in those colonies?

*A.* I can give no information whatever relative to the Military Hospitals in the West Indies from my own observation, but I know the general mode of conducting them differs in no material respects from that pursued in all others of Her Majesty's colonies. Some small difference there must be in all places, according to the localities, the facility of obtaining supplies of provisions, price of articles, &c. but the general plan is the same every where.

The Registers, the mode of keeping the Records, the system of Return, progressive responsibility, and the Regulations for the duties are the same, varied only according to local circumstances.

*Q.* 2. How long have you been in India as Inspector-General of the Royal Military Hospitals in India, and are you well acquainted with the mode in which they are conducted, with the manner in which the Records of the numbers of the sick of Her Majesty's troops admitted, treated, and discharged are kept, and of the periodical Returns required to be made by the Medical Officers of Her Majesty's army in Great Britain and Ireland, in the colonies, and in India, by Her Majesty's Military Officers in charge of the sick?

*A.* I have been Inspector of Hospitals to the Royal Forces in India since April, 1830, and in that time I have served in the three Presidencies of Bombay, Madras, and Bengal, and my duty has led me to visit every part of these territories where Her Majesty's Forces are stationed.

I am, as matter of course, acquainted with the mode in which the duties of the Royal Military Hospitals are conducted in India, as well as in other countries, with the keeping of the Records of the sick, their admissions and discharges from Hospital, their treatment, and, in fact, with all the particulars of their Medical history either in or out of Hospitals, whenever they are incapable of performing their Military duties.

The Returns required by the Regulations, and which are duly furnished by the Medical Officers of Regiments are;—

1st. A Daily Morning Statement, which is sent to the Commanding Officers of the regiments, and to the Inspector of Hospitals, if under any circumstances he thinks it necessary to call for one; but the last is rarely required, unless on the breaking out of unusual sickness, or in the event of any thing occurring which renders it necessary to have early information of the state of the regiment.

2d. A Weekly Return sent to the Inspector, from which a general one is made out and submitted to the Commander-in-Chief, with such observations briefly stated as may appear necessary.

3d. A Monthly Return, embodying the information in the Weekly Returns, a numerical list of the deaths in the regiment, a numerical return of the officers, women, and children who have been under Medical treatment, and a return of the Medical officers of the corps, shewing their actual state, and how and where they are employed, and a short statement of the cases of officers who have died in the month. None of these are transmitted to England, but the last forms the basis of the Annual Return.

4th. A Quarterly Return and Report is made up to the 31st March, 30th June, 30th September, and 31st December, respectively. These Reports contain a short Medical history of the events of the quarter, with such suggestions for the improvement of Barracks and Hospitals, and whatever may affect the health of the troops, as the state of the weather, the seasons, or prevailing disorders, may suggest.

The Quarterly Returns and Reports are not sent to England as they are received from the different regiments, but are consolidated or abridged, as may be necessary, by the Inspector, and transmitted in duplicate to the Director-General.

5th. The Annual Return and Reports are due at the close of the year, and they are transmitted as they are received from Regiments and Hospitals, with a General Summary by the Inspector, and observations on the parts of them to which he thinks it necessary to direct the attention of the Director-General.

The Annual Reports form an historical register of the Medical events of the year, and whatever is likely to affect in any degree the health or welfare of the troops.

Copies of these Returns and Reports are kept in the Inspector-General's Office for reference, and for the inspection of all Medical Officers or others who wish to make themselves acquainted with the condition of Her Majesty's army in India at different places, and at any particular period; in fact, for the purpose of conveying general information relative to the health and efficiency of the army, and I may say, the health of the country generally.

*Q.* 3. Is there any difference in the Records or Returns required to be kept or made by these Officers in Hospitals at home, and in Hospitals abroad; what are the circumstances regarding each patient which are recorded; and in what manner are the Records kept at home and abroad; and what are the periodical Returns, and containing what particulars, which are respectively made from Medical Military Officers in charge of Hospitals at home and abroad, and to whom are such Returns made?

*A.* There is no difference in the form or periods of furnishing the Returns and Reports at home and abroad, except that in the West Indies and Ceylon, there are separate columns for the white and black troops.

I beg to forward copies of all these Returns for the information of the Committee.

Besides the books into which the Returns and Reports stated in the last answer are copied, there is kept in every Hospital,—

1st. A Medical Register to contain a detailed history of every case of disease, with the treatment employed, and a daily entry of diets and extras. Copies of cases of particular interest are sent to the Inspector's Office, as well as of fatal cases, and reports of dissection. This book is daily filled up at the bed-side of the patient.

2d. An Admission and Discharge Register, in which every man's age, disease, &c. are entered.

3d. An Alphabetical Index with all the names in the Register, with references to the numbers and page of the Case Book, in which the man's whole Military and Medical history may be traced without trouble during his various admissions, from the day he joins the regiment till he leaves or dies.

4th. A Letter Book, in which all official letters either written or received are to be entered.

5th. A Register Book for reports on recruits, and for cases of vaccination and small pox.

6th. A Defaulter's Book.

All these books are to be kept with the greatest care, and to be deposited in the Surgery for inspection. If these books and Returns are kept with care and attention, they afford every information respecting the state of the corps that an inquirer may wish for as regards disease, endemick, epidemick, contagious, as well as the influence of climate, season, and accidental changes of the weather.

Regular Meteorological Tables are kept in each regiment, and the statistics and peculiar characters of stations and localities occupied by troops always form a part of the Annual Reports. A considerable mass of information on the effects of localities, Barracks, and Hospitals on the health of the troops is already collected, but it is not yet so arranged or so complete, as to be made available for exact statistical purposes; but in the course of a short time the information thus acquired, and daily accumulating, will become of immense value, and form a fund that can be depended on for statistick purposes as applicable to the health of Europeans in India.

*Q.* 4. Are there any and what facilities afforded, by the manner in which these Records are kept in Her Majesty's Military Hospitals, and the Returns made by the Medical Military Officers in charge of them, to the obtaining accurate statistical information upon the important results arising from the history of endemick, epidemick, and other diseases, and the influence upon these diseases of climate and of different modes of medical management, and upon the ratio of mortality in different diseases, and in different climates, and of the reference this has to age or sex?

*A.* This question is answered by my replies to the last. I can only add, that it requires constant attention and regularity to keep a system of Returns bearing on one another from a day to a year, so as to shew correct results applicable to useful statistical purposes; but with care, and giving up a small portion of his time daily, there is nothing to prevent any

man of common observation from keeping the different tables now in use in the Medical Department of Her Majesty's army, so as to shew the influence of climate, and of different modes of Medical management, on the rates of mortality, &c. &c. in different diseases, and under all circumstances likely to occur.

*Q.* 5. It is in evidence before the Committee, that the Records of the Presidency General Hospital consist of journals of the cases of every patient treated—that a Morning Report by the Surgeon of all other Military Hospitals of the Company, except the Presidency General Hospital, is directed to be made of the sick in Hospital daily to the Commanding Officer of the Regiment or Battalion, and by the Surgeon of the General Hospital to the Superintending Surgeon of the Presidency, in the form herewith exhibited to you; but it does not appear that any permanent or general use is made of these Returns, and the Superintending Surgeon is not required by the Company's Regulations to make such use of them, and they do not come at all under the observation of the Medical Board, to whom is committed the superintendence, under the Commander-in-Chief only, of the Medical Department.

It appears that a monthly numerical Return of sick of European and Native regiments is directed to be made by the Surgeons in charge of other Hospitals to the Superintending Surgeons of Divisions, and by the Surgeon of the Presidency General Hospital to the Superintending Surgeon of the Presidency, according to form (A) page 65 of the Code of Regulations for the Medical Department of the Bengal Establishment, now shewn you; and Monthly Reports of the general state of Hospitals, and of the sick in their respective divisions, are directed to be made by Superintending Surgeons to the Medical Board, which general Reports are to be accompanied by Monthly Returns of the sick in Hospitals of European and Native corps respectively, it is presumed according to the above form A; and on the first of each year the Medical Board is directed to compile a Report from those of Superintending Surgeons on the Hospitals of European and Native corps, and lay the same before Government for its information; but that Quarterly and Annual Returns from the Company's Hospitals are not made of the sick in the Company's Hospitals, except only of Her Majesty's troops. In your opinion are there any and what defects, as regards the obtaining accurate data in Medical statisticks for the improvement of Medical science, particularly in relation to tropical diseases, and to their operation upon European constitutions, in the manner in which these Records or journals are kept; and are these Returns framed regarding the sick in the Company's Hospitals, other than Her Majesty's troops; and in what respects in your opinion more defective than the Records and Returns required in the Medical Department of the British Army?

*A.* I am not acquainted with the manner of keeping the cases in the Calcutta General Hospital, but I have heard they are written on loose and detached sheets. It is however evident that where large numbers are treated, if the cases are not regularly entered in books kept for the sole purpose, with an index for reference, and by which the whole medical history of a man can be traced in a few minutes, keeping cases is of no further use than as forming a guide to the practitioners at the time. They cannot become useful records, or be made available for statistical purposes, which, next to the immediate treatment and cure of the sick, is the most important object of Medical management. As I know nothing of the Returns and books kept in the Regimental Hospitals of the Honourable Company's service, beyond those given in the Code of Regulations, I cannot give more satisfactory answers to this question.

I think it likely, however, the Returns and Reports in use in Her Majesty's service would require some modification to adapt them to the Company's service, particularly to the Native part of it; but I have no doubt a system of tables might be easily formed

that would, with very little trouble, give every medical and statistical information necessary. The Returns now in use, as they appear in the Book of Regulations, are defective, as not bearing on one another, and forming at the end of the year a connected numerical history of the whole period.

*Q.* 6. Are you sufficiently acquainted with the practice in the most approved Hospitals for the reception of the sick generally in Great Britain and Ireland, or in Paris, to state the manner in which the Records of those Hospitals are kept, with a view to the statistical information before mentioned, and the degree of attention paid in those Hospitals to the extent and accuracy of its attainment? What is your opinion of the value to Medical science of its attainment; and do you think that its attainment is of peculiar importance, and that the actual want of it is peculiarly felt by Medical practitioners in the treatment of the diseases prevalent in India, both amongst Natives and strangers?

*A.* I was several years ago well acquainted with the manner of conducting practice in many Hospitals in the British dominions, but I never was immediately concerned in keeping Records except in Military Hospitals, where perhaps more regularity is observed with regard to such documents than in Civil Hospitals. Of late years much greater attention has been paid to statisticks generally than used to be formerly, when the value of such information was not appreciated, and it was only the pursuit (perhaps the hobby) of a small number of individuals; but many of them being men of intelligence and observation, their labours attracted notice; and even from the imperfect knowledge they were able to publish, great advantages to the publick health resulted, and most of the improvements in Jails, Hospitals, and every kind of publick buildings, owe their origin to the labours of these men, who brought facts to light as regarded municipal economy and publick health, that were never before suspected, and which are now in process of being acted on, to the great benefit of the whole civilized world; for the improvements in progress are not confined to any particular portion of it, though Germany, France, and England are taking the lead.

The Medical statisticks of India have been little cultivated, and but a small portion of information collected by industrious individuals has been yet given to the publick, but there is no reason why the diffusion of statistical information, as applicable to Medical purposes, would not be quite as beneficial as it has proved in Europe, indeed more so, as there is a greater extent of country of which we know little, and a smaller number of men of education to inquire into its condition, and render local knowledge applicable to useful purposes, which might be done with great advantage to the population, both Europeans and Natives, and this description of knowledge enters more or less into every question connected with national affairs.

*Q.* 7. It is in evidence before the Committee, that there is no account framed in the Presidency General Hospital, nor in any other Hospital in India, nor any Return made by the Medical officers in superintendence of them, of the average daily number of patients treated in the Hospital during any year, and that in the Presidency General Hospital, and in all the other Military Hospitals in India, the Medical officer in charge of the Hospital orders daily the rations of diet for each patient—that an abstract of these rations shewing the sort and amount of diets required, but not shewing the number of persons for whom required, is transmitted to the Commissariat Department, by whom orders are issued for the supply—that Diet rolls are transmitted by the Surgeon in charge to the Superintending Surgeon; but are not to be retained by him, but forwarded to the Secretary to the Military Board in the Commissariat Department—and that the Medical officer in charge of the Hospital, the Superintending Surgeon, and the Medical Board, are not acquainted with the expenditure incurred in the Hospital for diet, medicines, and other

necessaries. In what respects does this arrangement differ from that in her Majesty's Military Hospitals at home and in the Colonies; and in what respects, and to what extent, do you consider it less conducive to the economical management of Hospitals?

*A.* As far as this question applies to Hospital Returns, I have already answered it. If the Returns are duly kept, the daily number, or the average number for any period, can be seen at once. The amount of provisions consumed of every description is easily ascertained, as every item is marked on the Diet Table, and hung up in the Wards, that every patient may see what he is entitled to. These tables are entered by months into a book kept for inspection, and every ounce of food or drink ordered, whether regular diet or extras, can be ascertained for any period. The Surgeon is however not an officer of account. By the present Regulations of India he is merely answerable for quantities, the prices being in the Department of the Commissary.

In Her Majesty's service, both at home and in the Colonies, the Surgeon is equally responsible for the quantities consumed and for the prices charged. The Diet rolls are kept so as to be conveniently referred to by the commanding Officer of the corps, or by the inspecting Officer, and they are forwarded to the War Office if they are required. The accounts of the Surgeon are closed quarterly, and abstracts properly countersigned accompanying them as vouchers.

The Surgeon may have his supplies from the Contractor for the troops if he likes, but if he can procure them on better terms, or of better quality from other parties he may do so; all bills are in such cases to be settled monthly by the Medical officer himself.

I append a form of Table, No. 1, which might be made out at monthly periods, without any great increase of labour, and which would shew at once not only the precise amount of articles consumed, but also the prices; and I see no reason why the whole expenditure of Hospitals might not in this way be finally closed at short periods, either monthly or quarterly as might be judged best—*Vide* Table, No. 1. Whether, this plan or that adopted in India would be the most economical, I cannot take upon me to say.

In both, the sick soldier may have his wants equally supplied, if all the officers discharged their duties strictly; but it is probable that when the Medical officer is answerable for both supply and price, the public interests will be best consulted; and certainly the wants of an Hospital can be more readily provided for by the Medical officer, than through the intervention of a Commissary, often engaged in other duties, to him of more importance, at a distance, and always acting as regards the Hospital through the medium of Native servants, rarely very trustworthy.

*Q.* 8. Is there any limit imposed upon the discretion of Surgeons in Her Majesty's army in the ordering for patients in Hospitals such food, wine, &c. without reference to expense, as they may think fit, and is it not their first duty, and that on which their reputation depends as Military Medical officers, to restore the soldier as quickly as possible to the discharge of his duty, without reference to the expense; and are you of opinion that the placing in the hands of the Surgeon the regulation of the expense, as well as of the quantity and nature of the patient's diet, and rendering him thereby responsible for the amount of expense, has ever had the effect of lowering the supply either in quantity or quality, to the detriment of the patients in Military Hospitals, or is likely to do so in Civil Hospitals?

*A.* The regulations of the service prescribe certain rules for the diet of persons in Hospitals, which are not deviated from; but there is a class of extra articles which the Surgeon may issue as he thinks necessary, and of any kind he sees fit, or his patient may fancy. There is no limitation to this indulgence, only when any articles not in common use are ordered, or the quantities are large, an explanation of the particular circumstances

under which the expense is incurred is entered in the Medical Register, and a copy accompanies the quarterly expenditure Returns as a voucher.

The first duty of a Medical man is assuredly to restore his patient to health in as short a time as possible, and without reference to expense; but it fortunately so happens that the preservation of life and the recovery of health depend but rarely on means which are costly, the effect resting more on the right application of them than on the price or difficulty of procuring them; but the use of even costly medicines, if their Medical value is sanctioned by experience, and if they are chosen with judgment, are almost always a saving, though the apparent expense may be greater. For instance, if a man with ague is cured in a week by quinine, an expensive medicine, while under the ordinary treatment it would take a month or six weeks to cure him by common bark, or other cheaper means, there is an evident saving in the expense, and a publick benefit, in the man's being so much sooner fit for his duty. Whether the expense of Hospitals would be less than at present, if the supply was entirely in the hands of the Surgeon, I cannot take upon me to say; but I think the soldier would be a gainer by such arrangement, in so far that there would be fewer references, and the Surgeon would be enabled to act immediately, and correct abuses which at present he cannot do without complaining to his commanding Officer, often to the General of his Division, and ultimately to the Commissary, by which a portion of time is consumed uselessly, and bickerings and complaints originated which might be avoided.

The object of the Surgeon is the care of the sick, and every arrangement which is connected with it, in order to be well executed, ought to be the work of one person in design, and to be executed under his direction, in fact under his eye. The intervention of a Commissary, therefore, in Hospital matters in this army, appears to me to be a clumsy and unnecessary expedient, which answers no useful purpose, and certainly does not tend to lessen expense. I do not mean that the Surgeon should be in any way a contractor, or that his interest should in the smallest degree be placed in opposition to his duty, but that the supplies and the payments should be equally under his controul, and that his accounts should be open to the inspection of his superiors, and undergo ample scrutiny, as in England and in all Her Majesty's Colonies, where this system works well, and a saving is made on the stoppage made from the soldier's pay while he is in Hospital, after paying for every article he is supplied with, except medicine

*Q.* 9. Are you acquainted with the reforms made by the late Dr. Jackson, or on his suggestion, in the expense of the Military Hospitals in the West Indies and at home? Have you the means of stating to the Committee the nature of those reforms, and the extent of the saving produced? It has been stated to the Committee that his principle was, that the stoppages of the soldier's pay whilst in Hospital ought to be amply sufficient for his maintenance while there; for that the necessary abstinence of the great majority would compensate the extra cost of the more expensive provision for the few. Can you inform the Committee to what extent his opinion has been justified by the result of following out his suggestions in the Military Hospitals at home?

The Committee have understood that the stoppages have produced a large surplus after paying the dieting expenses; do you know to what amount, and can you form an opinion whether this surplus has been equal to any considerable part, or to what part, of the other expenses of the Hospitals, as of medicines, salaries of Medical and other attendants, repairs, &c.?

*A.* I cannot speak with precision of the reforms made by Dr. Jackson, as his plans were in operation in a great measure before I came into the service. The great merit of his reforms in the West Indies consisted in recommending the abolition of extensive con-

tracts entered into in the early part of the war for the supply of the troops and Hospitals, and coming into the open markets for all supplies, by which enormous sums were saved to Government, a most injurious monopoly broken up, and the soldier was better served, as the markets became amply supplied. The principle on which Dr. Jackson founded his economy of Hospitals, was the very simple one, that the expense of dieting a man under disease ought not to exceed that of dieting him in health ; and that his pay was fully adequate to defray the expenses of his maintenance in Hospital. This plan has been in operation for many years ; and the result is, that not only has feeding the soldier in Hospital been defrayed by the stoppage from his pay, but a large surplus has accumulated, which, as far as I know, is still unappropriated to any specifick purpose. The amount of this surpuls I have no opportunity of knowing, but it must be large, as all regiments at home, and many in the Colonies, had a yearly surplus after defraying every expense of men's diets, extras, wine, and Hospital servants.

*Q.* 10. Can you give the Committee any information regarding the results of Dr. Jackson's suggestions in the West Indies?

*A.* I know nothing further of Dr. Jackson's plans in the West Indies than I have stated ; but I know he adopted the same system when in charge of the General Hospitals at Chatham and the Isle of Wight, and with similar results.

*Q.* 11. The Committee have understood that the stoppages for British soldiers while in Hospital amount to 9d. per day, and of European soldiers in India to three annas per day. Is this information correct ; and are you of opinion that the amount of stoppages of European soldiers in India, viz. three annas per day, is sufficient, or more than sufficient, and if more, to what amount more than sufficient, for the maintenance of Europeans in Hospital on the average in India, and upon what grounds do you found your opinion?

*A.* The stoppages from the pay of a soldier in Hospital in Britain was formerly 9d., but for some years it has been raised to 10d I have stated already it is more than sufficient to defray every expense of the soldier while sick in Hospital ; but how much over, I have no means of knowing. The Hospital stoppage in India is less than in England, being for Non-commissioned officers three annas, and privates two annas, women and children one anna. How far these sums would go to defray the expenses of patients, I have no means of knowing myself, but I have been informed by Stewards and others conversant with the subject, they consider it equal to the cost of the provisions, and would engage to supply every article of diet with that sum, under the ordinary circumstances of an European regiment in Bengal

(*Signed*) D MACLEOD,

*9th February*, 1839. *Inspector-General.*

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# No. 79. (A)

## I.

*Expenditure of articles in the Hospital of H. M's. 26th Regt of Foot, for the Month of January, 1838.*

| Articles. | Full diet. 124. | | Half diet. 158. | | Chicken. 89. | | Low diet. 289. | | Milk. 286. | | Spoon. 289. | | Extras. 591. | | Total. 1817. | | Expense. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | lbs. | oz. | lbs. | oz | lbs. | oz. | lbs. | oz. | lbs. | oz. | lbs. | oz. | lbs. | oz. | lbs. | oz. | Rs. | As. | Ps. |
| Meat. | 124 | 0 | 118 | 8 | 0 | 0 | 144 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 387 | 0 | | | |
| Bread. | 124 | 0 | 158 | 0 | 89 | 0 | 144 | 8 | 286 | 0 | 140 | 0 | 235 | 8 | 1177 | 0 | | | |
| Chicken, | 0 | 0 | 0 | 0 | No. | 89 | 0 | 0 | 0 | 0 | 0 | 0 | No | 76 | No. | 165 | | | |
| | | | | | lbs. | oz. | | | | | | | | | lbs. | oz. | | | |
| Butter, | 7 | 12 | 4 | 15 | 2 | 12½ | 0 | 0 | 8 | 15 | 0 | 0 | 0 | 0 | 24 | 6½ | | | |
| | pints | drams | pints | drams | pints | drams | pints | drams | pints | drams | pints | drams | pints | drams | pints | drams | | | |
| Milk. | 24 | 4 | 31 | 3 | 17 | 4 | 57 | 4 | 629 | 1 | 56 | 0 | 158 | 0 | 970 | 1 | | | |
| | lbs. | oz. | lbs. | oz. | lbs. | oz. | lbs. | oz. | lbs. | oz. | lbs. | oz. | lbs. | oz. | lbs. | oz. | | | |
| Sugar. | 7 | 12 | 9 | 14 | 5 | 9 | 18 | 1 | 17 | 14 | 17 | 8 | 10 | 13 | 87 | 7 | | | |
| Tea, | 3 | 14 | 4 | 15 | 2 | 12½ | 9 | ½ | 8 | 15 | 8 | 12 | 0 | 0 | 38 | 5 | | | |
| Rice, | 15 | 8 | 19 | 12 | 11 | 2 | 36 | 2 | 35 | 12 | 35 | 0 | 12 | 12 | 166 | 0 | | | |
| Salt, | 3 | 14 | 4 | 15 | 2 | 12½ | 9 | ½ | 8 | 15 | 8 | 12 | 0 | 0 | 38 | 5 | | | |
| Onions, | 3 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 14 | | | |
| Barley, | 3 | 14 | 4 | 15 | 2 | 12½ | 0 | ½ | 0 | 0 | 0 | 0 | 0 | 8 | 21 | 2 | | | |
| Pepper. | 0 | 7¾ | 0 | 9¾ | 0 | 5⅓ | 1 | 2¼ | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 9¼ | | | |
| | mds. | seers | mds. | seers | mds. | seers | mds. | seers | mds. | seers | mds. | seers | mds. | seers | mds. | seers | | | |
| Firewood, | 6 | 8 | 7 | 36 | 4 | 18 | 14 | 18 | 14 | 12 | 14 | 0 | 15 | 20 | 76 | 38 | | | |
| | | | | | | | | | | | | | lbs. | oz. | lbs. | oz. | | | |
| Sago, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 2 | 4 | | | |
| Sogee. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 8 | 17 | 8 | | | |
| Arrowroot, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 2 | 4 | | | |
| Coffee, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Ginger, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | | | |
| Flour. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 12 | 16 | 12 | | | |
| Nutmegs, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Potherbs for Soup, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 13 | 8 | 13 | | | |
| Eggs. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | No. | 108 | No. | 108 | | | |
| | | | | | | | | | | | | | Doz. | B.m. | Doz. | B.m. | | | |
| Port Wine, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 2 | 0 | 0 2 | | | |
| Beer, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 2 | 1 | 0 2 | | | |
| Brandy, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 0 | 0 | 0 0 | | | |
| Lime Juice, | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 1 | 0 | 0 1 | | | |

N. B. The Column of "Full Diets" are given to Hospital apprentices, very few patients requiring more than Half Diet.

# No. 79. (B)

## II.

*Alphabetical Index to the Admission and Discharge Book.*

| Regimental No. | Names. | Companies. | Country. | Year of arrival in India. | Age when Enlisted. | Date of Enlistment. | Trade. | Register | Page. | Died of, | 1st Number. | 2d. Ditto. | 3 Ditto. | 4 Ditto, | 5 Ditto. | 6 Ditto, | 7 Ditto, | 8 Ditto, | 9 Ditto, | 10 Ditto, | 11 Ditto, | 12 Ditto, | 13 Ditto, | 14 Ditto, | 15 Ditto, |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 415 | Hannagan, Michael, .. | 7 | I | 1831 | 18 | 6th April, | Labourer. | 8 | 42 | ,, | 1827/1331 | 1828/199 | | | | | | | | | | | | | |
| 555 | Kennedy, Michael,.. | 9 | I | 1828 | 19 | 7th June, | Ditto. | 8 | 120 | ,, | 1338/67 | 1338/201 | | | | | | | | | | | | | |
| 332 | Leinster, Samuel. ... | 7 | I | 1826 | 20 | 6th Aug. | Tailor. | 9 | 19 | ,, | 1837/389 | 1838/197 | | | | | | | | | | | | | |
| 215 | MacFadden, James,.. | 9 | I | 1827 | 22 | 17th March, | Labourer. | 9 | 58 | ,, | 1838/144 | 1838/202 | | | | | | | | | | | | | |
| 290 | Sullivan, Dennis, ... | 8 | I | 1830 | 22 | Ditto, | Ditto, | 9 | 68 | ,, | 1826/777 | 1828/198 | | | | | | | | | | | | | |
| 155 | Smith, John, (2) ... | 1 | I | 1834 | 22 | Ditto, | Ditto, | 10 | 62 | ,, | 1838/150 | 1838/200 | | | | | | | | | | | | | |
| 666 | Tierney, Cornelius,.. | 1 | I | 1825 | 18 | 13th Oct. | Ditto. | 10 | 142 | ,, | 1837/301 | 1838/196 | | | | | | | | | | | | | |
| 715 | Walbank, Jonas, ..... | 9 | E | 1824 | 18 | Ditto, | Ditto. | 14 | 6 | Dysent Ac. | 1837/162 | 1838/203 | Dead. | | | | | | | | | | | | |

No. 79. (c)

III.

*Form of the Admission Register.*

| Number. | Former Number. | Names. | Rank. | Country. | Company. | Year of arrival. | Age. | When volunteered. | Former Trade or occupation. | Register. | Page. | Diseases. | By whom Treated. | When Admitted. | When Discharged. | Died. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 196 | 301 | Cornelius Tierney, | Priv. | I. | 1 | 1825 | 20 | ,, | Labourer, | 11 | 42 | Syphilis Prim. | Dr. D. | 5th Mar. | 21st Mar. | | |
| 197 | 389 | Samuel Lienster, | ,, | I. | 7 | 1826 | 38 | 1830 | Tailor, | 11 | 77 | Fractura Clavic. | Dr. B. | ,, ,, | | | |
| 198 | 777/1826 | Dennis Sullivan, | ,, | I. | 8 | 1824 | 33 | ,, | Labourer, | 14 | 159 | Phegmon, | Dr. D. | 6th ,, | 14th Mar. | | |
| 199 | 1331/1827 | Michael Hannigan, | ,, | I. | 7 | 1824 | 22 | ,, | Ditto. | 14 | 160 | Hepatitis ac. | Dr. B. | 8th ,, | 14th ,, | | |
| 200 | 150 | John Smith, (2d) | ,, | I. | 1 | 1834 | 27 | ,, | Ditto. | 14 | 138 | Gonorrhœa, | Dr. D. | 9th ,, | 21st ,, | | |
| 201 | 67 | Michael Kennedy, | Corpl. | I. | 9 | 1828 | 28 | 1830 | Ditto. | 13 | 50 | Subluxatio Genii. | Dr. D. | ,, ,, | 18th ,, | | |
| 202 | 144 | James MacFadden, | ,, | I. | 9 | 1827 | 25 | ,, | Ditto. | 13 | 126 | Syphilis Prim. | Dr. D. | ,, ,, | | | |
| 203 | 162 | Jonas Walbank, | Priv. | E. | 9 | 1824 | 30 | ,, | Ditto. | 14 | 143 | Dysent ac. | Dr. B. | ,, ,, | | 12th Mar. | |

# No. 80.

*Additional queries to which answers are requested by the Fever Hospital and Municipal Committee from*

## DR. MACLEOD,

*Inspector General of Her Majesty's Military Hospitals in India.*

*Q.* 1. Have you in the course of your duties, since your last arrival in Calcutta, visited the portion of the buildings of the Presidency General Hospital set apart as a Regimental Hospital for such of Her Majesty's troops as are in garrison at Fort William? If so, will you be so good as to state to the Committee whether the building now occupied as a Regimental Hospital for the Queen's troops is, in your opinion, well constructed as an Hospital for troops, natives of Great Britain and Ireland, and what in your opinion, are its excellencies or defects as such Hospital, in the climate and locality of Calcutta, in point of situation, aspect, airiness, elevation from the ground, size, spaciousness, and convenience of the Wards or Apartments, and of general construction; and if in your opinion it is defective, in what respects or particulars it is defective, and whether these defects are capable of being removed by alterations made upon the present building, and by what alterations?

*A.* I have frequently visited, and I am well acquainted, with that building. It consists of two stories, raised upon a basement or ground floor, of about ten feet high, in which Medical and other stores are kept. The first and second stories intended for patients consist each of one long, low, narrow Ward (146 feet by 17) with an enclosed verandah on each side, ten feet wide, in which it certainly never was the intention that patients should be placed, though, unfortunately, they have often been so.

The doors and windows are all venetianed, and about three years ago were all glazed, at the recommendation of the present Commander-in-Chief, and in 1825 or 26 an open verandah, 14 feet broad, was added to the south side of the building. In other respects the Hospital remains in the same state in which it was built some sixty or seventy years ago, and considering the great improvements that have been made in Hospital arrangements since that period, it is not to be wondered at, if it be now found in many essential points deficient in the accommodation required by the sick of an European Regiment. That this has long been felt, is sufficiently proved by the constant representations on the subject both to the local Government and to the authorities at home, made by the Medical Officers whose Regiments have been stationed in Fort William, and also by the late Inspector-General of Hospitals of H. M's. Forces in India, and by myself. The results of such representations have already been noticed, in the erection of the southern verandah, and in the supply of glass doors and windows, both of which have been attended with very great advantage to the sick, as appears by the Table, No. 1.—The grand proof, however, of the defects of this Hospital in accommodation and convenience, was the erection of the New Military Hospital, which forms the subject of the third set of queries of your Committee, to be afterwards answered. The matter may however be represented in a more plain and tangible form, by which any person may be enabled to form his own opinion of the defects in question, and may be shortly stated thus—

1st. Defects that depend on original faulty construction, and are irremediable; and, secondly, such as may be wholly or partially rectified or removed.

In the first class, the most important defect is the want of space between the floor and the ceiling in both stories, but more especially in the first, where the height does not exceed twelve feet and a half, and in the upper story it is only fifteen feet.

The want of space over head is totally incompatible with due and regular ventilation in a crowded Hospital, where a strong current of wind is to be avoided, and yet a moderate circulation of air is absolutely necessary. This may appear less evident to people who have been accustomed to live in large and roomy apartments, but every Medical Officer familiar with the Wards of an Hospital will be of a different opinion. Open doors and windows do not suffice for the due ventilation of a crowded Hospital, unless there be space within to allow the heated air to ascend ; and in a climate like this, where a cold and chilly night often succeeds a hot day, the occasions are numerous where the apartments require to be shut up to windward ; under such circumstances, a crowded Ward with a low roof becomes prejudicial to health. A blast of cold wind is destruction to patients under various forms of acute disease, and the sense of oppression and suffocation arising from contaminated and heated air, few persons will submit to, who can possibly escape from it, at whatever risk. It is therefore my opinion that for several months in the year neither punkahs nor any other means can render this low Ward fit for the accommodation of the sick of an European Regiment.

With regard to the upper story, though still much too low for an Hospital, yet being so much further removed from the ground, it is less objectionable than the other, and might be made a comfortable Ward by certain improvements. It is a fact, however, well known to every person who attends to such subjects, that the temperature of the upper story in every flat-roofed house depends much upon the height of the rooms, and the thermometer in this very Ward has frequently stood above 90° for many days and nights successively during the hot season.

2d. Though the narrowness of the Wards (only 17 feet) is a very great objection, yet it is of so much less importance than the lowness of the roof, that in treating of the same building it hardly deserves to be separately noticed. One of the disadvantages however of this want of breadth in the Wards, is, that it deprives the patients of the use of tables and chairs (or forms) which no permanent Hospital should be without, and the patients are consequently obliged to eat their meals sitting on their beds off the low teapoys, which are intended only for the use of those who are unable to get out of bed. This deficiency is the cause of much discomfort to the patients during convalescence, and greatly increases the difficulty of keeping the Wards clean.

3d. The accommodation besides being as above shewn defective in quality, is also deficient in regard to quantity, for the usual number of sick of an European Regiment stationed in Fort William. Since the addition of the southern verandah, patients can be placed in the enclosed verandah on that side with comparative comfort, and in this way the Hospital will hold 70 men, and by occupying the enclosed verandah on the north side 17 more (or in all 87 patients), but certainly not very comfortably. The Cameronians now quartered in Fort William besides being weak in point of numbers, have been peculiarly healthy, yet even they have had as many as 99 men in Hospital. The above calculation is made by allowing eight feet square to each patient, which even in Europe is considered necessary, and which in this Hospital ought not to be diminished, and could not without placing two beds close together, or, what would be still worse, having them in the draft between the doors and windows, or in the archways between the pillars.

I am aware that this estimate of the accommodation of the Hospital is much lower than what it has been rated at by some Medical men, who have gone so far as to state that the above number could be doubled without inconvenience, or, in other words, that four feet only should be allowed to each patient. To such statements it may be a sufficient answer, that if they were even not injurious, they could not be practised without a direct breach of the orders respecting Hospital accommodation as applied even to Europe. In a

Return from the Barrack Department in Fort William, I find the building rated as affording accommodation for *three hundred men*, which would be allowing two feet to each patient. By whom, or on what authority, such estimates are formed, I do not know; but they are much to be regretted, as leading to deception, and to injuries of the most serious and hurtful nature to the sick soldier, should it ever be necessary to apply them to practice.

4. The want of separate Wards for the proper division and classification of patients according to their diseases, and for convalescents, is among the defects that cannot be remedied, in consequence of the lowness of the roof not admitting the necessary partitions, without total obstruction of ventilation. There are not even means of separating a noisy, delirious, or dying patient, by whom the whole Ward is consequently liable to be disturbed.

5. Having thus enumerated the defects arising from the first class of these remarks, such as may be partially or wholly remedied come now to be stated.

6. There being no verandah on the east or west end, or on the north side of the Hospital, the sun shines into the Wards for several hours in the morning and in the evening, during the hottest period of the year, covering an extent of several beds in each row; and the only defence against this inconvenience is to shut the venetians and glass windows, by which the heat is very partially and the fresh air totally excluded. Every shower of rain that does not come directly from the south, beats in upon the patients, unless recourse be had to this measure of excluding the fresh air by shutting the windows.

7. During the rains the patients have no place to walk in but the southern verandah, which is scarcely ever available for that purpose. The excretions of all patients under active treatment for dysentery, cholera, fever, liver complaint, and many other diseases, require to be placed aside for inspection, and there is no place for this purpose but the southern verandah, which during the prevalence of southerly breezes forms a nuisance that need not be described. In other Hospitals this is of course easily avoided, by keeping the utensils in the leeward verandah, which leaves all others free for the patients to take exercise in.

8. The inconveniences stated in the last two paragraphs being all occasioned by the want of a verandah all round the Hospital, similar to that on the south side, application for its erection was made to Government about the beginning of last year by the Surgeon of the Cameronians, and it was recommended by the Superintending Surgeon and the Medical Board, and by the Officers of the Engineers, who were ordered to report upon the subject. Estimates were called for, and desultory correspondence was carried on for some time, but has hitherto produced no effect that I know of. If the present building must necessarily remain as a Regimental Hospital, there cannot be a doubt of the propriety of immediately erecting the verandah proposed, which, though it would never make the Hospital a good one, would yet add much to the comfort and health of the patients, and lessen in a great degree, the deficiencies above pointed out. By this means also four small rooms (two on each side the staircase to the north) would be rendered available, which are now useless, or nearly so, from the exposure of their windows to the sun and to the rain. Their length is 22½ feet by 8 feet 5 inches, only much too small to be used for patients in their present state. It is the more singular that there should have been any difficulty in obtaining the verandah in question, as this Hospital is the only one in Bengal, that I am aware of, without a verandah all round it.

9. Table, No. 1, shews a very curious Return of the mortality that has occurred in this Hospital for a period of 16 years, by which it will be seen that the ratio of deaths has sensibly diminished since the erection of the outer verandah, and still more remarkably so, since the glazing of the doors and windows, which is a very strong argument for the further improvements above alluded to.

The following extract from the Annual Report of sick of the Inspector-General of Hospitals of H. M's. Forces in India, for the period ending 31st December, 1831, shews with what difficulty, and after what delays, the very small matter of glazed windows was obtained.

Reporting on the state of this Hospital, he says, the doors and windows (which are sufficiently numerous,) are only furnished with venetians, which however do not afford a sufficient protection against the inclemency of the weather, particularly in the cold damp foggy season during the nights. To remedy this last inconvenience, a representation has been made to the Government, recommending that glazed doors and windows (the lower third boarded and the 2-3 upper portion glazed) be furnished immediately, but this has been refused by the Government.

Similar reports had frequently been urged during the five or six previous years, and were constantly repeated, yet it was not until 1836 that they were attended to, and with what result the accompanying Table will shew.

10th. With regard to the aspect of the present building (which was originally built for a store) it happens to be as good as could be chosen. It faces north and south, thus presenting its whole length to the influence of the south-west and north-east monsoons, which are alternately the prevailing winds in Calcutta. Another advantage which this aspect has in this instance, is that the smallest surface of the building is that presented to the heat of the morning and evening sun.

11th The points of airiness, elevation from the ground, size, spaciousness and convenience of the Wards, and general construction mentioned in the latter part of the first query, appear all to have been disposed of, and there remains now only something to be said with regard to the *locality* and situation of the Hospital. This is a copious subject, on which much might be said, but it is also a very plain one, and evident to the senses of every one who chooses to turn his attention to it.

As regards the accommodation of the sick of the Regiment stationed in Fort William, the *distance* from the Fort is the first objection which presents itself to the situation of the Hospital. It is nearly a mile from the Barracks, which is attended with the following inconveniences—It causes a very great delay, generally an hour or two, and often much more, before the patient after reporting himself sick can be brought to Hospital—It causes also much exposure of the patient either to the heat of the day or to the damps and cold of the night, which in many diseases, such as cholera, severe fever, or affections of the head, must frequently be attended with dangerous and even fatal effects.

It occasions also a separation of the Medical Officers of the Regiment, thereby preventing them from assisting one another in their duties, as required by the rules of the service. One must be permanently stationed in the Fort, and the Surgeon at the Hospital with one of the Assistants with him (when both are present with the corps) a circumstance which very seldom happens. The distance however sinks into insignificance when compared with the more serious disadvantage of the locality itself.

The Regimental Hospital forms the east wing of the three buildings called the General Hospital, which stand in a low and damp compound, surrounded by a high wall which separates them from the village of Bhowaneepore on two sides, the east and the south. The huts of this village (notoriously the most populous, the most filthy, and the most unhealthy of all the suburbs of Calcutta) are actually built close up to the wall, above which they may be seen raising their thatched roofs, interspersed with shrubs and trees, and rank vegetation of all sorts, which are encouraged by the Natives as a screen to hide their hovels, their dunghills, and the filthy puddles where they wash themselves, and round which they deposit all the ordure and the offal of the village. There is a deep and stagnant ditch immediately without the wall, in some places wet and in others dry, and which so far as I have been able to discover, has no outlet even in the rains. I have

several times attempted to walk round between the wall and the huts, but hitherto without success. The number of Pools and Tanks have never been counted, in short, it is the dirtiest village I can recollect ever to have seen in India.

I here speak more particularly of that narrow strip of ground lying between the Hospital wall and the road leading eastward from behind Mr. Beardsmore's Lunatick Asylum, in which there are not more than two or three poor brick buildings, and I should think that the whole might be cleared away at a very trifling expense. This space is occupied by the very lowest of the populace of the suburbs, and in a great degree by the families of sweepers and people attached to the Hospitals. In it also are haunts for the sale of country spirits, and debauchery of all sorts, attended with the noise and uproar usual in such places.

In 1804 or 5 a memoir was given in to Government by Dr. Buchanan respecting the unhealthiness of this locality, in which he recommended that this collection of nuisance and rubbish should be cleared away, and added to the Esplanade, as a means likely to improve in a great degree this part of the suburbs, and especially to diminish the mortality in the General Hospital.

That the above picture is not exaggerated, but applies to the whole of the village (extending from the road in question to Tolly's Nullah) is shewn by the following description of Bhowaneepore, given by Mr. Martin in his late publication.—" This is the most populous of the Native suburbs, and I believe was the most severely visited by the epidemick remittent fever in 1833. To this calamity it would seem peculiarly exposed through its low, closely-built, and ill-ventilated streets, its great stagnant ditches, lined with rank vegetation, its back ground of extensive marsh and underwood, and its innumerable half-dried tanks and pools."

With regard to the interior of the Hospital compound, though it is kept clean and in good order, yet in point of fitness as a situation for an Hospital, it is not much superior to the village described, and in which it may be said to be placed. Within a few yards of the east end of the Regimental Hospital are two tanks, which have often been complained of as the source of intermittent fevers, and it is worthy of remark that several of the earliest cases of this type of fever which appeared in the Cameronians last year affected patients who were in Hospital for other diseases, and when the disease was not prevailing at all in the Fort.

This circumstance is the more remarkable that it happened soon after the largest tank had been cleaned out, and the mud from which had been allowed to remain in large heaps round its border, and almost under the Hospital windows. Some of this noxious and offensive accumulation, the product of eleven years, was buried in pits dug by the side of the tank and covered over with a thin layer of earth, until the measure was represented to the Superintending Surgeon by the Surgeon of the Cameronians, after which part of what remained was spread over the compound, and the rest carried away, which all of it ought to have been at first.

From one of these tanks the water is taken for the use of the Hospital, and on the banks of the other is performed all the washing of the Establishments—a filthy operation every where, and in this country also a very noisy one, and which should never be permitted within the precincts of an Hospital. This last tank is small and filthy, and is situated or rather concealed in the south-east corner of the compound, between its wall and the Female Hospital, and no one who sees its green and slimy surface in the hot weather, can entertain a doubt of its insalubrity. After having said so much respecting this Hospital, its compound, and its locality, it seems almost unnecessary to add that its ventilation is very imperfect, especially in the first floor, in consequence of the neighbouring buildings both inside and outside the compound, by its high surrounding walls, trees, &c. on the south side, by which means the free circulation of the atmosphere is interrupted and rendered impure.

I have been induced to enter thus fully into the demerits of the present Hospital, in consequence of the contradictory and exaggerated statements I have both heard and seen on the subject, and I hope that for the opinions I have given, reasons have been stated in such a manner as to make them plain and evident to every one.

Q. 2. Have you visited the part of the Hospital retained for the purposes of a General Hospital for Europeans and Americans; and if so, will you be so good as to state to the Committee your opinion with regard to these buildings in the same particulars, and considered as a Medical and Surgical Hospital for Europeans and Americans, in all the different grades of life in which persons, natives of those countries, are found in this; whether belonging to the Military or the Naval profession, or to neither?

*A.* I have occasionally visited these buildings, and know them well enough. That forming the west wing of the General Hospital, resembles in every respect the building described in the last answer, in a line with which it stands, about fifty yards apart, and of which it is indeed the exact counterpart in size, form, and construction. It may perhaps be supposed to have some slight advantage in point of circulation of air, being more open to the west, and less obstructed towards the south, where it is bounded by the compound and garden of the Lunatick Asylum, which being kept clean, are less objectionable than those parts of Bhowaneepore already described.

In this building the sick of the annual party of invalids and of the recruits are accommodated, which generally arrive about November or December of each year, and remain a month or six weeks; with this exception, this wing of the Hospital has been quite empty for the last two or three years.

With regard to the centre building, which may more properly be called the General Hospital, its size and construction will be best understood by reference to the ground plan* in Table No. 2.

It is a much larger building than either of the wings, and so far as the distribution of the Wards is concerned, better adapted for an Hospital. It is 185 feet in length by 100 in breadth, two-storied, and flat-roofed, consisting of eight Wards below, and nine above, of the dimensions laid down in the Table. This doubtless is an advantage, either as a General or as a Regimental Hospital, as it admits of the necessary division and classification of the patients according to their different diseases or circumstances, and the partitions consisting chiefly of venetians, ventilation is less obstructed than would otherwise be the case. The whole Hospital is well paved with the Chunar stone. The ground floor is low, and in the wet weather must be very damp, being only raised between two and three feet above the surface of the ground.

It is 16 feet 9 inches high to the ceiling, and the upper story is 21 feet in height, the doors and windows are venetianed and glazed, and are sufficient in regard to size and number; yet all these advantages are in a great measure rendered unavailing to the comfort of the patients, by the want of a verandah, in consequence of which, both the long Wards to the south, and the smaller ones to the east and west ends, are fully exposed to the heat of the sun, and are thus, during the hot season, very unfit for the accommodation of patients suffering under acute diseases.

This inconvenience may have been the less felt in consequence of the small number of patients admitted of late years, who might consequently be accommodated in the centre Wards, but were the full number of patients in it which the building is calculated to contain, the necessity of a verandah must be admitted by every one.

This deficiency becomes the more striking, when we are told that this building, originally a private garden-house, was purchased by the Government in 1795, and has since been altered and added to, until it has cost the sum of one hundred and thirteen thousand three hundred and eighteen Rupees. (Rs. 1,13,318.)

* Note.—This Plan has not been sent.

As a General Hospital for the treatment of Europeans and Americans, it is well adapted in so far as the Wards of the upper floor are concerned; with the important exception of the want of a verandah on the south and at both ends; but in many other respects it is very unfit for that purpose.

In point of situation it is obnoxious to all the disadvantages stated as attaching to that of the Regimental Hospital; but in regard to its distance from Calcutta, there is an inconvenience which is peculiarly its own.

It is nearly two miles from Calcutta, and more than that from the great bulk of the shipping, from which it formerly received the majority of its patients; and the consequence is, that since the Howrah Hospital was established, four years ago, the admissions into the General Hospital have diminished very considerably. On this subject I beg to refer to Table No. 3, shewing the monthly admissions for the last two years, amounting in 1837 to 636, and in 1838 to 620; and if from the first period the admissions of the two first and the two last months of the year, when the invalids and recruits went through the Hospital, be deducted, those of the remaining eight months will amount only to 277, being a monthly average of 33 only.

For the last year, 1838, the falling off is still progressive, shewing a total of 620, from which, when the three months of January, November, and December are deducted, there remains only 263 patients during the other nine months, or a monthly average of 29, about one-fourth of the average admissions of an European Regiment.

In October, 1837, a Committee, of which the Medical Board were members, was ordered to report upon the state of the Regimental Hospital, in consequence of an application from home respecting the new Military Hospital, now occupied as the Sudder Court, and the following is an extract from the minute of Dr. Sweeney, (then President of the Medical Board) which bears directly upon the present question.

"It is however my opinion that the building (the Regimental Hospital) can never by any additional verandah to the north, be rendered a befitting Hospital for the sick of a Regiment quartered in Fort William; and I deem it well deserving the deliberation of Government, whether the building now appropriated as a General Hospital, might not, with advantage to the State, be made over to H. Majesty's service.

"The very superior accommodation afforded in the construction of this building as an Hospital, can in no shape be considered longer called for, now that the applications for admissions from the town and vicinity have been to that degree limited by the recent establishment of so many places where the sick of Calcutta are accommodated, as in a great measure circumscribes its usefulness to the publick, at the same time that it renders the General Hospital (let the talents of the Surgeon in charge be what they may) no longer that pre-eminent School of Medicine to newly-arrived Assistant Surgeons, that characterized it under former regulations.

"I consider the upper Ward of the building now used as a Queen's Hospital, with the occasional use of the lower, as fully adequate to the purposes of a General Hospital, as at present constituted, and that the transfer of the building for the purposes of a Regimental Hospital to Her Majesty's service, would give every satisfaction upon the question under discussion from the home authorities."

The accuracy and the reasonableness of this opinion cannot be doubted by any one who will take the trouble either to look at the buildings in question, or to examine the Table above alluded to; and lest it might be supposed that there must be something peculiar in the condition of these two years, I beg to refer to Table No. 4, giving the annual return of sick in this Hospital from January 1830, to December 1838, inclusive, a period of nine years, which will fully substantiate the present statement, and serve another useful purpose, which is to shew, that the proportion of mortality in tropical

diseases to the number treated, has uniformly been so great as to exceed any thing that I have ever known in any Hospital, or station in India, for an equal period of years; and this holds good with respect to all the diseases mentioned in the Table. These are matters which do not strike casual observers, and are only to be come at by access to Returns which have not usually been carefully kept in this country; and if kept, seldom used; yet when brought to notice, they establish such facts as cannot be refuted, and scarcely admit of any satisfactory explanation. They* do not correspond with the usual result of disease under common management in any part of the world that I have been in. It must necessarily follow that there exist some disadvantages peculiar to the General Hospital, to account for this extraordinary mortality, and as the most important of which, I would beg to point out the following—

First, the great distance of the Hospital from the shipping, and the residence of that class of people from among whom the patients are chiefly derived, thus causing great delay with regard to the period of admission, and much exposure to the heat and the vicissitudes of the weather previous to it. All are aware how soon many diseases in this country, such as cholera, fever, dysentery, and cerebral affections hurry on to that stage when Medical treatment becomes almost unavailing. Hence we see one-half of all the choleras fatal, one-fifth of the dysenteries, one-tenth of the fevers, and so on.

The next disadvantage peculiar to the General Hospital, and to it alone, so far as I know of all the Hospitals on this side of India, is exposure of the patients in Hospital to the heat of the day, from the total want of verandahs. There may be other causes which I am unacquainted with, and it shares of course in all the evils arising from the unhealthy locality as detailed while treating of the Regimental Hospital.

These causes may be deemed by some fanciful, and insufficient to account for the appalling reality as stated in the Return, and whoever points out more tangible reasons, and how they can be obviated, will confer a benefit on society by doing so; but it is quite certain that the present state of things is little creditable to the municipal arrangement of the country, and should not be suffered to continue. Contrast with the above Table, that of No. 5, in which the Returns of the Howrah Hospital are embodied since its commencement in November, 1834, and what a different result is presented, the average mortality amounting only to 1 in 20½, or about one-half of that of the General Hospital, the actual number treated during the last three years being greater in the former than in the latter establishment, if the passing invalids and recruits towards December and January be deducted.

This result is the more remarkable, if it be considered that the Howrah Hospital was only lately instituted, and that, by the energy and zeal of one individual, (Dr. Duncan Stewart,) without publick assistance or establishment of any sort, and that its reputation now stands second to no publick Institution in Calcutta, either in point of usefulness, or the talent and success with which it is conducted. The concise and unpretending statement appended to the Return is like the Return itself, copied from the Calcutta Newspapers of the 5th January, and may be regarded as a very remarkable document.

All this good has been done without expense to the country, and on the very moderate charge of one rupee per diem for seamen and two for officers, scarcely exceeding the average charge for dieting an European soldier, as stated in the Commissariat accounts of this Presidency. How then is this superior result in Howrah to be accounted for as contrasted with that in the General Hospital?

* Note.—The only instances that I know of where such a mortality can be found for any long periods of time, are in some of the Hospitals of large and crowded Cities, where severe and fatal accidents are frequent, and numbers of poor and destitute people are admitted in an advanced stage of disease, as in a few of the Hospitals of London, Paris, &c.

On the same principle already laid down by the proximity of the Hospital to the shipping, by which the patients come under treatment at an earlier stage of the disease, and also because it is surrounded by a good verandah, which adds greatly to its coolness and comfort.

It may be alleged in explanation of the above remarkable contrast, that the description of patients received into the General Hospital are very different from the seamen treated at Howrah, who generally speaking are young and active men; and no doubt there is much truth in this statement, yet those received into the General Hospital are mostly persons living in some degree of comfort, and able to pay one rupee a day for their accommodation.

The poorer and more miserable classes are generally taken to the Police Hospital, because it is nearer and less expensive. The number of American or European foreigners are very limited, indeed not amounting probably to more than 16 or 20 in the year. From the above facts and documents it is my opinion, that the General Hospital is in point of situation ill adapted for the purpose for which it is used; and that in consequence of the very small number of patients admitted it is quite unnecessary, as they could be equally well accommodated and more successfully treated in Calcutta, or in any roomy house in Chowringhee near to it.

I fully agree in the opinion of the late President of the Medical Board, that if there be a necessity for the Queen's troops continuing to be treated in any of the buildings in the present compound, that the centre building ought to be given up to them as a Regimental Hospital; but certainly not until a verandah is erected on the south side and both ends.

With regard to the division of the Wards, which I have heard stated as an objection to its employment as a Regimental Hospital, I so far dissent from such an opinion, that I should never wish to see any Regimental Hospital without such divisions, the advantages of which are too evident to require to be stated here. It may not be out of place here to remark, that in the event of the General Hospital being removed to Calcutta, the invalids and recruits of Her Majesty's service who annually arrive at the Presidency might without difficulty be treated where they now are, under the superintendence of the Medical officers of the corps stationed in the Fort at the time, allowing of course that degree of assistance with regard to Hospital establishment which the number and nature of the cases might seem to demand. Having thus called the attention of the Committee to the great mortality in the General Hospital, I beg leave to add a comparative statement of mortality in Her Majesty's Regiments stationed in Fort William during a period of sixteen years, by which they will be enabled to judge what may be done, even under unfavourable circumstances, towards meeting the dangers of tropical disease by the due and careful union of Military and Medical discipline and economy, and how far it is an object of importance to improve those arrangements, on which the lives of many evidently depend.

The average deaths for 13 years amount to 59 nearly, for the first four years of which period the Returns are not complete, yet even as they are the mortality is excessive, and the Hospital until then had neither a verandah nor glass windows, neither the means of excluding the heat nor the cold and damp winds. For the last nine years of that period the Hospital had one good verandah, but no windows, and the average mortality still amounted to 40¼; since that period, for the last three years, the Hospital has been glazed, and the average mortality has only been 24⅓, or according to the number treated 1 in 40, Table No. 2. These are facts, and require little commentary

Q. 3. Have you visited the building in the neighbourhood of the General Hospital, now occupied as the Court House of the Sudder Dewanny and Nizamut Adawlut; and if so, please to state whether you think this building which was erected for an Hospital for the Queen's troops, under the direction of Dr. Burke, is, in your opinion well constructed and adapted, in all the respects which have been mentioned, for an Hospital for British troops, if it were reconverted to that purpose?

*A.* I have visited and minutely examined this building, and find it admirably adapted, both in regard of size and construction, for an Hospital for European troops. For that express purpose it was built and finished upwards of ten years ago, under the direction of the late Inspector General of Queen's Troops in India, and in consequence of his repeated representations of the unfitness of the old Hospital, with reference equally to size, construction, and situation, as shewn in my answer to the First Query.

To such a degree was that unfitness apparent, that many of the regiments that had occupied Fort William, were more than decimated in the course of one year, and several of them lost one-ninth of their number in the short period of seven and eight months, principally owing to the want of Barrack and Hospital accommodation. For these details vide Table No. 1.

Under these circumstances was the new Military Hospital (for the plan of which see Table No. 6) erected, care being taken to avoid all the errors in the construction of the old one. Instead of narrow Wards and low roofs, and no verandahs, as in the latter instance, we have here large and roomy Wards, 24 feet wide and 20 and 21 feet high, with an inner, enclosed, and outer open verandah on both sides, thus affording the means of preserving a moderate temperature both in the hot and in cold weather, with due ventilation at all times. There are separate rooms for such patients as require to be kept alone, and an ample space for any sudden influx of cases, for which all Hospitals should be provided on the appearance of epidemick diseases, by which crowding the Wards may be avoided, at the very time when room is most wanted.

By the neglect of such arrangements hundreds of lives have been sacrificed in this country; and many diseases have been rendered malignant and intractable, which under different circumstances would have readily yielded to the common remedies. There are also bath-rooms on each floor, and permanent shower-baths, with pumps and pipes for hot and for cold water, &c. &c.

In short, the building is constructed on the most modern and approved plan for Military Hospitals, and a plan of it should be sent to each Presidency for the future guidance of those who may be entrusted with the erection of such buildings. Among its other advantages over the old Hospital, may be mentioned its situation; which, although not far removed from the compound of the General Hospital, is yet very superior to it in point of airiness. This is accounted for by its being removed from the village of Bhowaneepore, and having a clear space all round it, with only one or two brick buildings between it and Tolly's Nullah, on the other side of which, and nearly opposite, is the clean and healthy station of Allipore, containing the residence of the Magistrate of the 24 Pergunnahs, the Jail and Hospital, &c. all of which grounds are well raised and better drained than any other of the surrounding suburbs of Calcutta, and have therefore long been the favourite resort of Europeans. Let any one contrast this with the account of Bhowaneepore given in a preceding page, and then say whether the two situations admit of any comparison in point of salubrity.

The compound of the new Hospital being clean, and without foul, half-dried tanks or other nuisances, and surrounded on three sides by an iron railing on a wall of only two or three feet high, gives it also a very great advantage in regard to a free circulation of air, without which no situation can be healthy.

The building itself will be easily understood, by reference to the plan in Table No. 6. It consists of two stories raised on an arched basement of eight or ten feet high, the two centre Wards on each floor being nearly 125 feet long by 24 wide, may be there seen divided into three apartments of 41 feet each, by temporary walls (marked in the plan × in ink,) for the convenience of the Officers of the Sudder Court. The internal verandah, extending on both sides the whole length of the building, is 17 feet wide, and would form excellent Wards, having both venetian and glass windows; and the present partitions already alluded to so far from being a disadvantage, are actually an improvement to it as an Hospital, constituting small Wards, the want of which in the old Hospital have been so much complained of, and is the prevailing error in the construction of nearly all the Hospitals in this country.

There cannot be a greater mistake than to suppose that any considerable number of patients can be found all requiring the same degree of ventilation, the same quiet, or the same restraint.

One patient in acute stage of many diseases is often a disturbance, and a source of misery to a whole Ward and, on the other hand, men during their convalescence ought to be allowed to sit up, to walk about, to read to one another, and, in short, to fall gradually into the habits of health, in so far as is consistent with the discipline of an Hospital; and these objects can never be obtained in very large Wards.

There ought besides to be a separate room where a Medical officer, or those of the subordinate department can sit and write, or remain either all day or all night during any extraordinary sickness (as in visitations of cholera,) and for want of which I have known Medical officers obliged to remain among the patients for days and nights successively; a degree of sacrifice (with whatever good-will it may be made) under which the energies of mind and body must equally give way.

After what has been said respecting the capabilities of this Hospital, it is hardly necessary to state how deeply it is to be regretted that after having remained unoccupied for several years it was at last given over in 1829 not to the troops, for whom it was built, but to the Civil authorities as a Native Court of Judicature, and still remains the Court House of the Sudder Dewanny and Nizamut Adawlut.

So little is it fitted for this purpose, in consequence of its great distance from Calcutta, especially from those parts chiefly inhabited by natives, that representations were made to Government by the Judges, and others connected with the Court, of the great inconvenience and hardship which the measure would cause to the publick, and which has since been severely felt, and much complained of, by all who have business to transact at this Court. During the hot weather of 1837 the Court was for some time shut, in consequence of the inability of the inhabitants to attend at the usual hours of business.

In what manner the two old store houses in the compound of the General Hospital happened to be fixed upon in 1795 for the reception and accommodation of the sick of Calcutta and its shipping, and the new Military Hospital in 1829, at an equal distance, for the accommodation of its Courts of Law, cannot easily be imagined.

Nothing can be more certain than that the publick benefit was not consulted in either instance; the General Hospital having continued up to this day the grave of every tenth man who entered it, and the Court-house, such as occasionally requires to be shut up during the hot weather, in consequence of the publick being unable to attend it at such a distance.

In the report already quoted (page 15) the late Dr. Burke states—"Although there does not exist a doubt but that disease is aggravated, and convalescence impeded or prolonged in this old Hospital (which it is said was originally built for a store) while the new and most excellent building erected on the most approved plan for an Hospital for European troops remains unoccupied, and liable therefore to deterioration, yet the Government still persists in not permitting the sick soldiers to be accommodated in the latter."

This extract is from the Report of the late Inspector General, for the year 1828, and is an example of the pressing representations which have long continued to be made by the Medical Officers in charge of the Regiments in Fort William.

I beg to append* a copy of a letter dated 23rd February, 1838, from the Surgeon of the Regiment now stationed there, to the Superintending Surgeon of the Presidency Division, and which (like so many others which have preceded it) has not been attended to.

The examination alluded to in the first paragraph of that letter was ordered in consequence of an application from the Horse-Guards to the Commander-in-Chief in India, urging the justice and expediency of supplying the place of the New Military Hospital, by the erection of another equally well adapted for the reception of sick soldiers. That either this should be done, or that the building should be restored to the purpose for which it was originally intended, must be admitted by every one who carefully considers the facts stated in the answer to these queries, all of which can be easily verified by an examination of the buildings in question.

Having thus stated the principal facts which appear to be necessary for the full elucidation of the various queries proposed by the Committee, I shall now conclude by repeating the following remarks—

1st. That the present Regimental Hospital is unfit for the accommodation of the sick of an European corps, for the reasons assigned.

2d. That the centre building occupied as a General Hospital is unfit for the accommodation of Europeans until it be surrounded by a verandah, as proved by the unprecedented mortality that has uniformly taken place in it.

3d. That if there be a necessity (for which I cannot see the least shadow of reason) why the European troops should continue to be treated in this confined, damp, and unwholesome compound, that the centre building being the least objectionable of the three, should be given up to them after a verandah has been added to it.

4th. That the new Military Hospital for the accommodation of European troops having been built in consequence of the proved unfitness of the old Hospital, should be given up for the purpose for which it was originally intended, the more especially as it is inconvenient in regard to distance, and unnecessary in regard to size, for the purpose to which it is now appropriated.

5th. That if the Government consider it necessary to retain the above building as a Court of Judicature, justice to the European troops requires that a similar one should be erected in an equally eligible situation for their accommodation.

If I have entered into greater detail than the queries proposed might seem to require, it is because I have felt it my duty to lay before the Committee such information, as if duly considered, seems likely to lead to measures calculated to confer a benefit equally on the European troops and on the publick service.

*(Signed)* DON. MACLEOD, M. D.
*Inspector General Her Majesty's Forces in India.*

CALCUTTA,
*February 9th*, 1839.

NOTE.—This Letter is inserted at page 239.

# No. 80. (A)

## No. 1.

*Comparative Statement of Mortality in Her Majesty's Regiments stationed in Fort William, from 1822 to 1838.*

| Regiments. | Years. | Strength. | Sick. | Deaths. | Cured. | Proportion of Deaths to Strength. | Proportion of Deaths to treated. | Remarks. | |
|---|---|---|---|---|---|---|---|---|---|
| 38th Foot. .. .. | 1822 | 866 | 1303 | 75 | 1228 | 1 in 11 $\frac{1}{2}$ | 1 in 17 $\frac{7}{9}$ | From 11th May, | 8 Months. |
| 13th do. .. .. .. | 1823 | 828 | 1687 | 46 | 1572 | 1 in 18 | 1 in 36 $\frac{16}{23}$ | ,, 23d. ditto, | 7 ditto. |
| 31st do. .. .. .. | 1825 | 6[illegible]2 | 903 | 62 | 875 | 1 in 9 $\frac{8}{9}$ | 1 in 14 $\frac{18}{31}$ | ,, 8th June, | 7 ditto. |
| 47th & 87th do. .. | 1826 | 863 | 1826 | 96 | 1611 | 1 in 9 | 1 in 19 $\frac{1}{48}$ | 47th from 20th April 87th for Nov. and Dec. | 8 ditto. |
| 14th do. .. .. .. | 1827 | 893 | 1336 | 56 | 1249 | 1 in 15 $\frac{53}{56}$ | 1 in 23 $\frac{6}{7}$ | | |
| 14th & 59th do. .. | 1828 | 913 | 1776 | 42 | 1821 | 1 in 21 $\frac{31}{42}$ | 1 in 42 $\frac{2}{7}$ | 14th for Jan.—and 59 from 1st Feb. | |
| 47th 59th & 16th do. | 1829 | 885 | 1955 | 58 | 1943 | 1 in 15 $\frac{15}{58}$ | 1 in 33 $\frac{41}{58}$ | 47th and 59th for Jan. and Feb.—and 16th from 1st. Feb. | |
| 16th do. .. .. .. | 1830 | 80[illegible] | 1722 | 59 | 1654 | 1 in 13 $\frac{41}{59}$ | 1 in 29 $\frac{11}{59}$ | | |
| 16th & 3d. do. .. | 1831 | 831 | 1061 | 57 | 1101 | 1 in 14 $\frac{33}{57}$ | 1 in 18 $\frac{5}{8}$ | 16th from 1st Jan. to 31st March—and 3d. from 1st April. | |
| 3d. & 49th do. .. | 1832 | 771 | 1024 | 59 | 1005 | 1 in 13 $\frac{1}{59}$ | 1 in 17 $\frac{3}{8}$ | 3d. to 31st Oct.—and 49th from 1st Nov. | |
| 49th do. .. .. .. | 1833 | 687 | 1387 | 64 | 1250 | 1 in 10 $\frac{47}{64}$ | 1 in 21 $\frac{6}{9}$ | | |
| 49th do. .. .. .. | 1834 | 608 | 1166 | 57 | 1167 | 1 in 10 $\frac{38}{57}$ | 1 in 20 $\frac{3}{7}$ | | |
| 44th do. .. .. | 1835 | 743 | 1211 | 33 | 1170 | 1 in 22 $\frac{17}{33}$ | 1 in 36 $\frac{2}{3}$ | | |
| Average of 13 years, | .. .. | 792 $\frac{2}{13}$ | 1412 | 58 $\frac{10}{13}$ | 1312 | 1 in 13 $\frac{301}{761}$ | 1 in 21 $\frac{1}{5}$ | The average from 1827 to 1835 is taken from the Records in this office (Inspector General's); those for previous years, for want of Records, are not complete, and the constant movements of the Regiments; yet in those years the deaths are much more than the latter years, although for only 7 and 8 months. | |
| Average of 9 years or from 1827 to 1835. | .. | 793 | 1404 $\frac{2}{9}$ | 40 $\frac{1}{2}$ | 1373 $\frac{1}{3}$ | 1 in $\frac{1319}{48}$ | 1 in 34 $\frac{27}{40}$ | | |
| 44th Foot, .. .. | 1836 | 734 | 1245 | 25 | 1190 | 1 in 29 $\frac{9}{25}$ | 1 in 49 $\frac{4}{5}$ | | |
| 26th ditto, .. .. | 1837 | 709 | 899 | 26 | 851 | 1 in 27 $\frac{7}{26}$ | 1 in 34 $\frac{3}{[illegible]}$ | Since the glass doors & windows were supplied to the Hospital. | |
| 26th ditto, .. .. | 1838 | 664 | 736 | 22 | 717 | 1 in 30 $\frac{1}{6}$ | 1 in 33 $\frac{5}{11}$ | | |
| Average of 3 years, or 1836, 1837, 1838. | ... .. | 702 | 960 | 24 $\frac{1}{3}$ | 919 $\frac{1}{3}$ | 1 in 33 $\frac{3}{7}$ | 1 in 39 $\frac{7}{8}$ | | |

NOTE. Table No 2, or No. 80 (B), has not been sent. Vide page 256

## No. 80. (c)

No. 3.

*Monthly Admission of Patients into the Presidency General Hospital, for the years 1837 and 1838.*

| Years and Months. | Remained on 31st December, 1836. | Admitted. | Discharged. | Died. | Remaining. | Years and Months. | Remained 31st December, 1837. | Admitted. | Discharged. | Died. | Remaining. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| January, 1837, .. | 82 | 83 | 100 | 7 | 58 | January, 1838, .. | 96 | 94 | 139 | 8 | 43 |
| February, ,, .. | — | 61 | 119 | 1 | 41 | February, ,, .. | — | 21 | 33 | 4 | 27 |
| March, ,, .. | — | 35 | 40 | 6 | 30 | March, ,, .. | — | 32 | 31 | 4 | 24 |
| April, ,, .. | — | 19 | 19 | 2 | 28 | April, ,, .. | — | 23 | 17 | 4 | 26 |
| May, ,, .. | — | 20 | 29 | 1 | 19 | May, ,, .. | — | 29 | 18 | 5 | 32 |
| June, ,, .. | — | 34 | 27 | 2 | 24 | June, ,, .. | — | 24 | 26 | 3 | 27 |
| July, , .. | — | 37 | 30 | 5 | 26 | July, ,, .. | — | 45 | 24 | 5 | 43 |
| August, .. .. | — | 45 | 29 | 4 | 38 | August, ,, .. | — | 29 | 34 | 4 | 34 |
| September, ,, .. | — | 46 | 48 | 9 | 27 | September, ,, .. | — | 24 | 22 | 9 | 27 |
| October, ,, .. | — | 41 | 34 | 5 | 29 | October, ,, .. | — | 36 | 27 | 4 | 32 |
| November, .. .. | — | 76 | 37 | 4 | 64 | November, ,, .. | — | 104 | 40 | 3 | 93 |
| December, ,, .. | — | 139 | 100 | 7 | 96 | December, ,, .. | — | 159 | 143 | 12 | 97 |
| Total, .. | 82 | 636 | 612 | 53 | 480 | Total, .. | 96 | 620 | 554 | 65 | 502 |

## No. 80 (D)

No. 4.

*Annual Return of Sick of the Presidency General Hospital for the year 1839.*

| | Fevers. | Hepatics. | Pulmonics. | Dysentery. | Apoplexy and Coup de soleil. | Cholera. | Venereals, &c. | Opthalmia. | Wounds & accidents. | | Other diseases. | Grand Total. | Proportion of deaths to No. treated. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Remained last Return...... | 38 | 2 | 0 | 10 | 0 | 0 | 4 | 3 | 4 | 0 | 33 | 94 | |
| Admitted........ | 441 | 40 | 27 | 103 | 3 | 64 | 41 | 16 | 49 | 0 | 198 | 982 | |
| Total....... | 479 | 42 | 27 | 113 | 3 | 64 | 45 | 19 | 53 | 0 | 231 | 1076 | |
| Discharged........ | 375 | 33 | 15 | 83 | 2 | 40 | 42 | 9 | 42 | 0 | 213 | 854 | 1 in 10 28/51 |
| Died............. | 39 | 7 | 8 | 15 | 1 | 22 | 1 | 0 | 1 | 0 | 8 | 102 | |
| Proportion of deaths to No. treated....... | 1 in 11 10/13 | 1 in 6 | 1 in 3½ | 1 in 7½ | 1 in 3 | 1 in 3 nearly | 1 in 45 | 0 | 1 in 53 | 0 | 1 in 29 nearly | 0 | |
| Remaining........ | 65 | 2 | 4 | 15 | 0 | 2 | 2 | 10 | 10 | 0 | 10 | 120 | |

## No. 80. (D) *Continued.*

### No. 4.

*For* 1831.

| | Fevers. | Hepatics. | Pulmonics. | Dysentery. | Apoplexy and Coup de soleil. | Cholera. | Venereals, &c. | Opthalmia. | Wounds and accidents. | | Other diseaes. | Grand Total | Proportion of deaths to No. treated. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Remained.... ... | 65 | 2 | 4 | 15 | 0 | 2 | 2 | 10 | 10 | 0 | 10 | 120 | |
| Admitted...... .. | 406 | 21 | 29 | 128 | 1 | 25 | 47 | 9 | 45 | 0 | 153 | 864 | |
| Total .. .. | 471 | 23 | 33 | 143 | 1 | 27 | 49 | 19 | 55 | 0 | 163 | 984 | |
| Discharged.. .. | 412 | 17 | 21 | 98 | 1 | 11 | 43 | 18 | 48 | 0 | 125 | 794 | 1 in 10 15/31 |
| Died... ........ | 34 | 1 | 8 | 20 | 0 | 15 | 1 | 0 | 3 | 0 | 11 | 93 | |
| Proportion of deaths to No. treated... .. | 1 in 13 15/17 | 1 in 23 | 1 in 4 1/8 | 1 in 7 1/5 | 0 | 1 in 1 1/5 | 1 in 49 | 0 | 1 in 10 1/3 | 0 | 1 in 14 5/6 | 0 | |
| Remaining...... | 25 | 5 | 4 | 25 | 0 | 1 | 5 | 1 | 4 | 0 | 27 | 97 | |

*For* 1832.

| | Fevers. | Hepatics. | Pulmonics. | Dysentery. | Apoplexy and Coup de soleil. | Cholera. | Venereals, &c. | Opthalmia. | Wounds and accidents. | | Other diseaes. | Grand Total | Proportion of deaths to No. treated. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Remained...... | 25 | 5 | 4 | 25 | 0 | 1 | 5 | 1 | 1 | 0 | 27 | 97 | |
| Admitted.. .... | 409 | 14 | 30 | 124 | 3 | 16 | 53 | 13 | 39 | 0 | 205 | 906 | |
| Total...... | 434 | 19 | 34 | 149 | 3 | 17 | 58 | 14 | 43 | 0 | 232 | 1003 | |
| Discharged.. .. | 363 | 13 | 20 | 122 | 3 | 6 | 49 | 10 | 36 | 0 | 165 | 787 | 1 in 11 7/12 |
| Died...... ... | 38 | 0 | 6 | 20 | 0 | 9 | 0 | 0 | 0 | 0 | 17 | 90 | |
| Proportion of deaths to No. treated. | 1 in 11 8/19 | 0 | 1 in 5 2/3 | 1 in 7 5/10 | 0 | 1 in 1 4/5 | 0 | 0 | 0 | 0 | 1 in 13 [illegible] | 0 | |
| Remaining. .. | 33 | 6 | 8 | 7 | 0 | 2 | 9 | 4 | 7 | 0 | 50 | 126 | |

*For* 1833.

| | Fevers. | Hepatics. | Pulmonics. | Dysentery. | Apoplexy and Coup de soleil. | Cholera. | Venereals, &c. | Opthalmia. | Wounds and accidents. | | Other diseaes. | Grand Total | Proportion of deaths to No. treated. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Remained....... | 33 | 6 | 8 | 7 | 0 | 2 | 9 | 4 | 7 | 0 | 50 | 126 | |
| Admitted........ | 856 | 26 | 36 | 128 | 4 | 24 | 60 | 12 | 37 | 0 | 272 | 1455 | |
| Total....... | 889 | 32 | 41 | 135 | 4 | 26 | 69 | 16 | 44 | 0 | 322 | 1581 | |
| Discharged...... | 721 | 25 | 31 | 108 | 4 | 11 | 62 | 14 | 33 | 0 | 265 | 1274 | 1 in 8 63/91 |
| Died .... .. ... | 107 | 5 | 8 | 19 | 0 | 15 | 0 | 0 | 4 | 0 | 24 | 182 | |
| Proportion of Deaths to No. treated ..... | 1 in 8 17/51 | 1 in 6 1/3 | 1 in 5 1/2 | 1 in 7 1/10 | 0 | 1 in 1 [illegible] | 0 | 0 | 1 in 11 | 0 | 1 in 13 5/12 | 0 | |
| Remaining...... | 61 | 2 | 5 | 8 | 0 | 0 | 7 | 2 | 7 | 0 | 33 | 125 | |

*For* 1834.

| | Fevers. | Hepatics. | Pulmonics. | Dysentery. | Apoplexy and Coup de soleil. | Cholera. | Venereals, &c. | Opthalmia. | Wounds and accidents. | | Other diseaes. | Grand Total | Proportion of deaths to No. treated. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Remained...... .. | 61 | 2 | 5 | 8 | 0 | 0 | 7 | 2 | 7 | 0 | 33 | 125 | |
| Admitted.... .. | 605 | 28 | 24 | 147 | 6 | 33 | 96 | 14 | 32 | 0 | 517 | 1502 | |
| Total...... | 666 | 30 | 29 | 155 | 6 | 33 | 103 | 16 | 39 | 0 | 550 | 1627 | |
| Discharged.. .. | 564 | 15 | 21 | 107 | 4 | 18 | 91 | 12 | 36 | 0 | 465 | 1333 | 1 in 8 33/97 |
| Died............ | 77 | 10 | 5 | 39 | 2 | 15 | 1 | 0 | 2 | 0 | 43 | 194 | |
| Proportion of deaths to No. treated.... .. | 1 in 8 25/39 | 1 in 3 | 1 in 6 nearly | 1 in 4 nearly | 1 in 3 | 1 in 2 5/5 | 1 in 103 | 0 | 1 in 19 1/2 | 0 | 1 in 12 17/22 | 0 | |
| Remaining... .. | 25 | 5 | 3 | 9 | 0 | 0 | 11 | 4 | 1 | 0 | 42 | 100 | |

# No. 88. (D) *Continued.*

## No. 4.

*For* 1835.

| | Fevers. | Hepatics. | Pulmonics. | Dysentry. | Apoplexy and Coup de soleil. | Cholera. | Venereals, &c. | Opthalmia. | Wounds and accidents. | | Other diseaes. | Grand Total. | Proportion of deaths to No. treated |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Remained...... | 25 | 5 | 3 | 9 | 0 | 0 | 11 | 4 | 1 | 0 | 42 | 100 | |
| Admitted..... | 243 | 35 | 44 | 71 | 1 | 29 | 55 | 15 | 34 | | 514 | 1041 | |
| Total .. | 268 | 40 | 47 | 80 | 1 | 29 | 66 | 19 | 35 | 0 | 556 | 1141 | 1 in 13 nearly |
| Discharged.. .. | 239 | 29 | 35 | 60 | 0 | 13 | 61 | 19 | 35 | 0 | 508 | 999 | |
| Died.......... | 16 | 7 | 10 | 20 | 1 | 16 | 1 | 0 | 0 | 0 | 17 | 88 | |
| Proportion of deaths to No. treated..... | 1 in $16\frac{3}{4}$ | 1 in $5\frac{5}{7}$ | 1 in $4\frac{1}{5}$ | 1 in 4 | 1 in 1 | 1 in $1\frac{7}{8}$ | 1 in 66 | 0 | 0 | 0 | 1 in $32\frac{2}{9}$ | 0 | |
| Remaining.. .. | 13 | 4 | 2 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 31 | 54 | |
| *For* 1836. | | | | | | | | | | | | | |
| Remained ....... | 13 | 4 | 2 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 31 | 54 | |
| Admitted.... . | 113 | 14 | 26 | 55 | 0 | 14 | 53 | 20 | 4 | 0 | 324 | 623 | |
| Total...... | 126 | 18 | 28 | 55 | 0 | 14 | 57 | 20 | 4 | 0 | 355 | 677 | |
| Discharged... .. | 109 | 12 | 19 | 33 | 0 | 8 | 49 | 15 | 4 | 0 | 286 | 535 | 1 in $11\frac{3}{10}$ |
| Died.......... | 12 | 2 | 6 | 10 | 0 | 6 | 0 | 0 | 0 | 0 | 24 | 60 | |
| Proportion of deaths to No. treated.. .. | 1 in $10\frac{1}{2}$ | 1 in 9 | 1 in $4\frac{2}{3}$ | 1 in $5\frac{3}{5}$ | 0 | 1 in $2\frac{1}{3}$ | 0 | 0 | 0 | 0 | 1 in $14\frac{5}{6}$ | 0 | |
| Remaining... .. | 5 | 4 | 3 | 12 | 0 | 0 | 8 | 5 | 0 | 0 | 45 | 82 | |
| *For* 1837. | | | | | | | | | | | | | |
| Remained, .. | 5 | 4 | 3 | 12 | 0 | 0 | 8 | 5 | 0 | 0 | 45 | 82 | |
| Admitted, .. .. | 101 | 29 | 11 | 63 | 1 | 9 | 40 | 9 | 15 | 0 | 358 | 636 | |
| Total, .. .. | 106 | 33 | 14 | 75 | 1 | 9 | 48 | 14 | 15 | 0 | 103 | 718 | |
| Discharged, .. | 92 | 25 | 8 | 47 | 0 | 5 | 40 | 12 | 12 | 0 | 328 | 569 | |
| Died,.. .. .. | 4 | 1 | 5 | 15 | 1 | 4 | 1 | 0 | 1 | 0 | 18 | 53 | 1 in $13\frac{5}{19}$ |
| Proportion of Deaths to No. treated, .. | 1 in $26\frac{1}{2}$ | 1 in $8\frac{1}{4}$ | 1 in $2\frac{1}{5}$ | 1 in 5 | 1 in 1 | 1 in $2\frac{1}{4}$ | 1 in 48 | 0 | 1 in 15 | 0 | 1 in $22\frac{1}{5}$ | 0 | |
| Remaining, .. | 10 | 4 | 1 | 13 | 0 | 0 | 7 | 2 | 2 | 0 | 57 | 96 | |
| *For* 1838. | | | | | | | | | | | | | |
| Remained, .. | 10 | 4 | 1 | 13 | 0 | 0 | 7 | 2 | 2 | 0 | 57 | 96 | |
| Admitted, . | 112 | 22 | 22 | 52 | 1 | 14 | 25 | 6 | 28 | 0 | 338 | 620 | |
| Total, .. .. | 122 | 26 | 23 | 65 | 1 | 14 | 32 | 8 | 30 | 0 | 395 | 716 | |
| Discharged, .. | 92 | 20 | 14 | 43 | 0 | 7 | 27 | 8 | 26 | 0 | 317 | 554 | |
| Died, .. . | 18 | 2 | 6 | 13 | 1 | 7 | 0 | 0 | 1 | 0 | 17 | 65 | 1 in $11\frac{1}{5}$ |
| Proportion of Deaths to No. treated, | 1 in 4 | 1 in 13 | 1 in 1 nearly. | 1 in 5 | 1 in 1 | 1 in 2 | 0 | 0 | 1 in 30 | 0 | 1 in $25\frac{2}{9}$ | 0 | |
| Remaining, .. | 12 | 4 | 3 | 9 | 0 | 0 | 5 | 0 | 3 | 0 | 61 | 97 | |

P. S.—Patients treated in the General Hospital for nine years amount to 9,523—the deaths for nine years being 927, thereby making a proportion of deaths to treated to be 1 in $10\frac{11}{40}$.

## No. 80. (D) *Continued.*

### No. 4.

*General Hospital—Average Proportion of Deaths to treated for Nine Years.*

| Diseases. | Treated during nine years. | Deaths for nine years. | Proportion. |
|---|---|---|---|
| Fevers, .. .. .. .. | 3,561 | 345 | 1 in $10\frac{111}{315}$ |
| Hepatics, .. .. .. .. | 263 | 38 | 1 in $6\frac{18}{19}$ |
| Pulmonics, .. .. .. | 279 | 62 | 1 in $4\frac{31}{62}$ |
| Dysentery, .. .. .. .. | 970 | 171 | 1 in $5\frac{58}{86}$ |
| Apoplexy, .. .. .. .. | 20 | 6 | 1 in $3\frac{1}{3}$ |
| Cholera, .. .. .. .. | 233 | 109 | 1 in $2\frac{8}{55}$ |
| Venereals, .. .. .. .. | 527 | 5 | 1 in $105\frac{2}{5}$ |
| Wounds and Accidents, .. | 318 | 12 | 1 in $26\frac{3}{4}$ |
| Other Diseases, .. .. .. | 3,352 | 179* | 1 in $18\frac{65}{90}$ * Delirium 3 included here |
| Grand Total, .. .. .. | 9,523 | 927 | 1 in $10\frac{11}{16}$ |

## No. 80. (E)

### No. 5.

*Number of Men received into the Howrah Seaman's Hospital from its formation in November, 1834, to 30th October, 1838.*

| Years | Officers | Seamen | Total | Died | Cured | Proportion of Deaths to treated | Remarks. |
|---|---|---|---|---|---|---|---|
| 1834 | 10 | 60 | 70 | 3 | 67 | 1 in $23\frac{1}{3}$ | |
| 1835 | 56 | 165 | 221 | 13 | 208 | 1 in $14\frac{11}{15}$ | |
| 1836 | 77 | 323 | 400 | 8 | 392 | 1 in 50 | Copied from "The Englishman," of the 5th January, 1839. |
| 1837 | 94 | 458 | 552 | 33 | 519 | 1 in $15\frac{27}{35}$ | |
| 1838 | 40 | 416 | 456 | 30 | 426 | 1 in $15\frac{1}{5}$ | |
| Total | 277 | 1422 | 1699 | 87 | 1612 | 1 in $20\frac{13}{28}$ | |

Sir,

After an experience of four years, I beg now to lay before the public a Return of the number of men received into the Howrah Seaman's Hospital during the last four years, with the result of their cases.

My greatest desire and interest is to make the Institution generally useful to the shipping of this Port, and I have spared no expense or labour on it; and am only sorry to say, the receipt of the Hospital (its only support) does not meet its disbursement, which exceeds 500 Rupees per mensem—for house-rent, establishment, clothing, bed-clothes, board, medicine, and medical attendance, all for one Rupee per diem for Seamen, and two Rupees per diem for Officers, which will not pay unless I am more generally supported by the Mercantile and Maritime community.

The utility of having the Institution so close to the river, is in a very great measure appreciated by those that have kindly visited the Institution, and it is my urgent desire to invite the public to visit the Hospital, so that they may be convinced of the arrangements I have made, and the immense expense I have gone to to make the patients comfortable.

I shall be thankful if the Committee of Management of the Sailor's Home would send their own invalids to my Institution, and in consideration of their having to pay their own expenses, I would admit them at a reduced rate.

*(Signed)* J. W. LINTON,
*Supt. H. S. H.*

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## No. 81.

To THE HONBLE. SIR J. P. GRANT. KNIGHT,

*Chairman of the Fever Hospital and Municipal Improvement Committee.*

Military Department.

Sir,

I have the honour to acknowledge the receipt of your letter of the 19th instant, and in reply to acquaint you, that, after a careful search, the Report of Doctor F. B. Hamilton upon the site of the General Hospital, and the Topography of the Suburb of Bhowanypore has not been found among the Records in this Department.

I have the honour to be,
Sir,
Your most obedient servant,
W. CUBETT, Major,
*Offi. Sec. to Government of India Mil. Depart.*

Council Chamber,
*February 25th,* 1839.

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# No. 82.

## NOTE ON THE RELATIVE MORTALITY OF HOSPITALS.

1st The ratio of mortality of the British soldiers in the Windward and Leeward Command from 1803 to 1816, was 138 per thousand: during the last 20 years it has been $93\frac{1}{2}$ per thousand; while the ratio for the whole island of Jamaica for the same 20 years has been 143 per thousand, or a seventh part of the force died annually. In Calcutta, the ratio of deaths per 1000 European soldiers has been for 20 years, 90, and at Berhampore for the same period, 114 per thousand annually. In some years there died annually in Jamaica, Up-Park, the ratio of 501, 443, and 341 men out of 1000 living; while in Fort William, Bengal, the ratio has been, out of 1000 men in some years, 149, 139, and 121, respectively; and at Berhampore, in some years, 258, 163, 167 respectively.

2d. In the Windward and Leeward Command, out of every 1000 men, 1903 admissions into Hospital took place per annum, so that every man was under treatment once every six months; while in Jamaica, out of every 1000 men, 1812 were admitted annually into Hospital, or every man had an attack of illness twice in thirteen months; but it is evident that in Jamaica the attacks of illness were of a more concentrated nature. Moreover it is evident that the number of admissions into Hospital merely, is of little use in determining the relative salubrity of any given climate, unless we also know the causes of them.

3d. Within the British Islands, every soldier is under treatment about once in every thirteen months, consequently the sickness, or admissions into Hospital are about twice as numerous in the Windward and Leeward Command as in England, while the deaths are, for this command 1 in 24, and in the United Kingdom, 1 in every 67 cases treated. The ratio of deaths per 1000 has been for many years 15; but since Cholera and Influenza visited the British Islands 17 per 1000 annually. Thus the mortality in the Windward and Leeward Command has been six times as high as in the United Kingdom.

4th. In the Windward and Leeward Command the proportion of deaths in fever were as follows for 20 years,

| | | | |
|---|---|---|---|
| Remittent, .. .. .. .. | 1 | in | 9 |
| Yellow, . .. .. .... | 1 | — | $2\frac{1}{4}$ |
| Acute Inflammation of the Liver, | 1 | — | 11 |
| Chronic, Do. Do. .. .. .. | 1 | — | 12 |
| Acute, Dysentery, .. .. .. .. | 1 | — | 5 |

5th. During 20 years the ratio of deaths to treated was as follows in Jamaica:—

| | | | |
|---|---|---|---|
| Remittent fever, .. .. .. | 1 | — | 8 |
| Yellow, Do. .. .. .. .. | 1 | — | $1\frac{1}{8}$ |
| Acute Inflammation of the Liver, .. | 1 | — | 12 |
| Chronic, Do. Do. .. ... .. | 1 | — | 5 |
| Acute Dysentery, .. .. .... | 1 | — | 40 |
| Chronic, Do. .. .. .. .. | 1 | — | 6 |

6th. At the Station of Secundrabad there died of the European soldiers, between the years 1804 and 1835, 2620 men, women, and officers; in the year 1835, one in four of all the sick in Hospital died, and in 1833—1837, one in six.

7th. At the Station of Dinapore, during a period of 12 years, out of an annual average strength of $885\frac{1}{2}$ men, there were admitted into Hospital, on an average, $1499\frac{3}{4}$, out of which there occurred an average of $61{\cdot}1\frac{1}{2}$ deaths, or one in $14\frac{31}{61}$ of the mean strength.

Of the cases treated during five years, there died of the following diseases,

| | | |
|---|---|---|
| Fevers, .. .. .. .. | one in | $33\frac{33}{87}$ |
| Dysentery, .. .. .. .. | one in | $8\frac{139}{155}$ |
| Hepatitis, .. .. .. .. | one in | $6\frac{19}{49}$ |

8th. At the Station of Berhampore, during a period of five years, out of an annual average strength of 759 men, there were admitted into Hospital, on an average, $1295\frac{2}{5}$, out of which there occurred an average of $66\frac{3}{5}$ deaths, or one in $11\frac{1}{2}$ of the mean strength.

Of the cases treated during five years there died of the following diseases,

| | | |
|---|---|---|
| Fevers, .. .. .. .. | one in | $19\frac{35}{123}$ |
| Dysentery, .. .. .. | one in | $9\frac{8}{73}$ |
| Hepatitis, .. .. .. .. | one in | $14\frac{1}{11}$ |

9th. The number of patients, according to Mr. G. R. Porter, admitted into St. Bartholomew's Hospital during forty-five years, between 1790 and 1834, was 184,051, and the number of deaths, 14,022; being at the rate of 7·62 per cent. stated in quinquennial periods. The numbers and proportions have been,

| *Years.* | | | *Admitted.* | *Died.* | *Proportion of Deaths per cent.* |
|---|---|---|---|---|---|
| 1790 | to | 1794 | 20,253 | 1,572 | 7·76 |
| 1795 | — | 1799 | 20,801 | 1,657 | 8·0 |
| 1800 | — | 1804 | 20,725 | 1,674 | 8·0 |
| 1805 | — | 1809 | 19,183 | 1,527 | 8·0 |
| 1810 | — | 1814 | 19,714 | 1,442 | 7·31 |
| 1815 | — | 1819 | 13,959 | 1,159 | 8·30 |
| 1820 | — | 1824 | 19,683 | 1,454 | 7·34 |
| 1825 | — | 1829 | 23,629 | 1,643 | 6·95 |
| 1830 | — | 1834 | 28,104 | 1,894 | 7·25 |

The small variation observable in the rate of mortality among the patients in this Hospital during the whole of the above period, extending to nearly half a century, is very remarkable, and does not certainly warrant any conclusions favourable to the progress of the curative art in general during that interval. In the latter periods, however, a large

number of the milder cases have probably been sent to Dispensaries, which were not common formerly. Many patients are also now treated at the houses of the patients from want of room in the Hospitals, In-patients being only admitted in the more serious cases.

The Returns obtained from the General Hospitals and Medical Institutions do not embrace a sufficiently long space of time to admit of any conclusions being drawn from them as to the progress of the curative art. They are curious, however, as presenting results very different from each other, with respect to the mortality of their patients. The difference is no doubt capable of satisfactory explanation, for it would be absurd to suppose, that if the regulations and other circumstances attending the practice of different Hospitals in the same city were the same, the rate of mortality should from year to year be so different.

The fair inference is, that the regulations are not the same, or that they are better in some Hospitals than in others.

We have seen that in St. Bartholomew's Hospital the rate of mortality has never been greater on the average of five years than 8·30 per cent; in forty-five years, from 1790 to 1834, the average was 7·53 per cent; and in the concluding five years of the series, the average has been only 7·25 per cent; whereas in other General Hospitals of this metropolis, which enjoy the advantage of Medical and Surgical skill on the part of their officers, in no wise inferior to that of the officers of St. Bartholomew's, the average rate of mortality has, in the same period of five years, exceeded 11 per cent., being in the proportion of more than three deaths to two—On the other hand, the mortality during the last five years in the Infirmaries of Manchester and Liverpool has been even smaller than that of St. Bartholomew's Hospital; the average in the first mentioned of these Infirmaries proves to be 7·16 per cent, and that of Liverpool only 5·57 per cent.

10th. In the fevers of London, the mortality in different years has varied according to the severity of fever at different times, but more especially according to the periods, whether early or late, at which the patients come under treatment. In the London Fever Hospital, the ratio of mortality from 1802 has varied from 1 in 3⅝ to 1 in 12, while in the Westminster Hospital it has been 1 in 10.

11th. The ratio of deaths to total admissions is, in the London Hospital 11·44 per cent., and at St. George's Hospital 11·19.

N. B. The ratios of deaths to admissions in a Civil and Military Hospital do not admit of comparison, as the admissions into the former are, on an average, on account of severe illness; whereas—a *soldier* with a cut finger, or an itch, comes as necessarily under medical treatment as for the loss of an arm.

In a Military Hospital too, the patients treated obtain relief on the instant of seizure, and are from a selected class of men of the mean age of 26; whereas in a General or Civil Hospital the miserable and worn out of all ages and stages of disease are daily admitted.

Dr. Hawkins states that next to the influence of *national* causes, the mortality of Hospitals is most affected by position and internal economy. These circumstances appear more powerful than even the various merits of practise; and happily for mankind, they are advantages of a definite nature, easily comprehended, and, of late years, generally demanded. The case was formerly very different, when a singular prejudice or indifference existed in respect to ventilation.

NATIVE HOSPITAL,
*February* 25*th*, 1839.

J. R. MARTIN.

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# No. 83.

*Extract from the Code of Regulations for the Military Department of the Army under the Presidency of Fort William, to have effect from the 1st day of August, 1816. (pages 34 to 36.)*

"The Rules prescribed for supplying diet, Hospital clothing, bedding, establishments, &c. for the Hospitals of European corps and General Field Hospitals, by the Commissariat Department, as well as the Rules established for the supply of Hospital wine, and generally all Rules for the management of those Hospitals, are likewise to be carried into effect at the Presidency General Hospital.

"The establishment of Hospital servants at the Presidency General Hospital is to be mustered on the 1st of every month, by the Member of the Medical Board performing the duty of Superintending Surgeon of the Presidency Station; by whom the Muster Rolls are to be duly attested.

"The Surgeon and junior Permanent Assistant Surgeon attached to the Presidency General Hospital, shall draw the same salaries or personal allowances as at present The senior Permanent Assistant Surgeon, at the Presidency General Hospital, shall, under the denomination of Medical Storekeeper, have the charge and custody of all medical stores and instruments belonging to the Hospital, and will supply the Country and Bazar medicines, and other articles specified in the 6th article of the 1st section of these Regulations for the Presidency General Hospital, on the principles which have been laid down in articles 4th and 6th of section 3d, with respect to such supplies in General Field Hospitals, and for this duty he shall in lieu of his present salary of Sonat Rupees 200 per month, be permitted to draw a personal allowance of Sonat Rupees 250 per month, as granted to the Medical Storekeeper with General Field Hospitals All other allowances (including that for doolies) for the purpose of which provision is made by these Regulations, are of course to cease from the date of the new system being carried into effect.

"The following is the scale of the establishment of servants fixed for the Presidency General Hospital; whenever any occasional increase may be necessary, a representation of the case is to be made to Government through the Commander-in-Chief, by the officiating Superintending Surgeon—

| | |
|---|---|
| Apothecary, European or Country-born, .. .. .. .. | 1 |
| Apprentices from the Orphan School, .. .. .. .. | 1 |
| Native Compounder, .. .. .. .. .. .. .. | 1 |
| Native Dresser, .. .. .. .. .. .. .. .. | 1 |
| Shop Coolies, .. .. .. .. .. .. .. .. | 2 |
| Steward, European or Country-born, .. .. .. .. .. | 1 |
| Apprentices from the Orphan School, .. .. .. .. | 1 |
| Bheesties, .. .. .. .. .. .. .. .. | 4 |
| Sweepers, .. .. .. .. .. .. .. .. | 5 |
| Ward Coolies, .. .. .. .. .. .. .. | 6 |

"The Bheesties and Sweepers to perform all the requisite duties in the departments both of the Apothecary and Steward.

"The rates of pay and half-batta for the establishment appertaining to the Presidency General Hospital, are to be the same as fixed for those of European corps, but the person at present holding the office of Apothecary at the Presidency General Hospital, having been allowed a salary of 100 Sonat Rupees per month, the same is to be continued so long as he may fill that office."

"The proportion of Hospital bedding, clothing, stoolpans, &c. &c. to be provided for the Presidency General Hospital, will, in the first instance be for fifty patients, according to the scale and description of bedding, clothing, &c. and under the same rules as fixed for the Hospitals of European corps;—additions thereto will be made when necessary, upon application to the Commissariat by the officiating Superintending Surgeon at the Presidency. The Table of Diet prescribed for the Hospitals of European troops, is likewise to be considered applicable to the Presidency General Hospital, and is to be conformed to accordingly, and the requisite establishment of cooks, barbers, washermen, tailors, and other subordinate servants for the Presidency General Hospital, according to the monthly average of patients therein, will be provided and maintained by the Commissariat, in communication with the member of the Medical Board, officiating as Superintending Surgeon for the Presidency Division. For patients received into the Presidency General Hospital whose expenses can be defrayed by themselves or their relations, and for sick men belonging to H. Majesty's or the Honorable Company's ships, or other vessels, whose expenses will be discharged by the Navy Agent at this port, or by the commander or owners of such ships or vessels respectively, a charge shall be made at the rate of one Sonat Rupee per day for each man; and this sum, which has been ascertained to be nearly the average amount of expense that will be necessarily incurred on account of such men, shall, by the Commissariat, by which it will be realized, be carried to the credit of Government in their accounts of Hospital charges for the Presidency General Hospital.

"The expenses of paupers from the Town of Calcutta, or elsewhere, and of seamen belonging to the Pilot Establishment and Honorable Company's Marine, who shall be admitted into the Presidency General Hospital, will be charged by the Military Auditor General annually to the Civil Department, and will be calculated at the rate of one Sonat Rupee per day, for every patient coming under either of these descriptions, as they shall appear at the end of each year on the monthly rolls of patients sent by the Surgeon in charge, to the Military Auditor General.

"Europe medicines and instruments for the use of the Presidency General Hospital, will, under the prescribed rules be supplied from the General Dispensary upon indents, according to the proper form, countersigned by the member of the Medical Board officiating as Superintending Surgeon, and passed by the Medical Board. Wine will be supplied under the same rules, as in other Hospitals for Europeans.

Upon the arrival of corps from Europe or from other Presidencies, their sick shall be sent to the Presidency General Hospital, and the member of the Medical Board officiating as Superintending Surgeon, will ascertain and decide when the requisite arrangement shall be made in the Commissariat Department, and the Medical Staff of the corps may be properly prepared for taking charge of the sick of their corps, upon the principle of Regimental Medical arrangement, when the sick are to be transferred accordingly from the Presidency General Hospital to the care of the Regimental Medical Staff. A certificate of this circumstance is to be regularly furnished by the Superintending Surgeon, which will serve as a voucher of the date from which the Regimental Medical Staff will be entitled to draw the established Hospital allowance for Country and Bazar medicines, &c. &c. &c.

"Hospital stoppages in all authorized cases are to be made from persons in the Military branch of the service whilst sick in the Presidency General Hospital, under the rules prescribed for realizing Hospital stoppages due from men of European troops, whilst sick in Hospitals or situations removed from their corps; and Regular rolls of all patients whatsoever, who may be admitted into the Presidency General Hospital, are to be sent to the Military Auditor General on the 1st day of each month by the Surgeon of the Hospital, through the Member of the Medical Board officiating as Superintending Surgeon, by whom they are to be countersigned."

"The rolls of patients belonging to the Military branch of the service in the Presidency General Hospital, to be forwarded as above directed, are to be separate and distinct from the rolls of such patients as are not comprehended in that class. The rolls of Military patients are to be prepared in the manner, and to be subject to the rules, prescribed under article 18th of the 3d. section of these Regulations. The monthly rolls of patients who do not belong to the Military Department, are to be prepared according to the following form; and one copy of these rolls is to be transmitted, as above directed, to the Military Auditor General, and another copy to be furnished at the same time to the Commissariat, to guide that Department in realizing the charges above specified on account of patients whose expenses are not defrayed by the Honourable Company.

*Roll of patients not belonging to the Military Department in the Presidency General Hospital, for the month of 1816.*

| Description of Patients. | Names. | Admitted. | Discharged. | Died | No. of Days. | By whom sent in. | To whom Charged. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| His Majesty's Seamen, .. | A. B. | Aug. 1 1816 | Aug. 15 1816 | .... .... | 14 | Cap. S—of the Theseus | Navy Agent | |
| | C. D. | Do. 5 Do. | .... .... | Aug. 10 1816 | 5 | Do Do. | Do. Do. | |
| Seamen Hon. Comp. Marine | E. F. | Do. 10 1816 | .... .... | .... .... | 21 | Marine Surg. | Government | |
| | G. H. | Do. 20 Do. | .... .... | .... .... | 11 | Mastr. Attdnt. | Do. | |
| Seamen of English and Foreign Trading Ships, | I. K. | Do. 5 1816 | .... .... | Do. 20 1816 | 15 | Owner of Ship | Owner of Ship | |
| | L. M. | Do. 10 Do. | Do 31 1816 | .... .... | 21 | Comdr. of—Ship | Comdr. of—Ship | |
| Townsmen, Mariners, &c. | N. O. | Do. 1 1816 | .... .... | .... .... | 30 | Messr. A.&Co. | Messr. A.&Co. | |
| | P. Q. | Do. 2 Do. | .... .... | .... .... | 29 | Do. Do. | Do. | |
| Paupers, .... | R. S. | Do. 5 1816 | Do. 10 Do. | .... .... | 5 | Police | Government | |
| | T. U. | Do Do. | .... .... | Do. 20 Do. | 15 | Medl. Board | Do. | |

*(Signed)* C. D *Superintending Surgeon, Presidency Division.*

*(Signed)* A. B. *Surgeon, Presidency General Hospital.*

"Regular certificates of admission and discharge are to be granted for all patients sent to the Presidency General Hospital, as directed by the General Orders by Government, dated 14th November, 1808.

"All such Discharge certificates are to specify the date of admission as well as of discharge, and are by all persons belonging to the Military service to be delivered by the individuals to the Officer commanding their Company, or other Officer, by whom their pay may be drawn for the time being. The Hospital registers, medical diaries, and monthly returns of sick, as prescribed for other Hospitals, are likewise to be regularly kept in the Presidency General Hospital, and copies thereof are to be duly presented to the Member of the Medical Board officiating as Superintending Surgeon.

"All Assistant Surgeons arriving from Europe are required to attend the Presidency General Hospital, under the Surgeon in charge for three months at the least, and as much longer as their services may not be elsewhere required, and to attend in the Hospital wards twice every day, so long as they may remain at the Presidency.

"The Presidency General Hospital is to be visited twice a month, at the least, by a Field Officer to be appointed for that duty from the troops at the Presidency Station, and daily by subordinate Officers, to be appointed to that duty as directed for other Hospitals. The Officer commanding the Presidency Station will be pleased to consider this as a standing order by Government, and cause it to be strictly attended to accordingly."

## No. 84.

To THE HONBLE. SIR J. P. GRANT.

MY DEAR SIR,

I fear that the accompanying Table is too late to be of much or any use to you, although it might be interesting in an Appendix if its results are found to be confirmatory of those derived from other more questionable sources of evidence.

I was in hopes of having ere this time completed a still more interesting Table, showing the influences of sex, age, occupation, caste, and season on disease, and the prevalence, intensity, and duration of particular diseases, &c., but I have only tabulated as far as about 18,000 cases, and must complete the number to 20,000 before striking the ratios and averages.

I fear I shall not be able to have this done in less than ten or fourteen days, as the papers have all to be translated, and are very badly arranged.

Should the present Table not be available for the purposes of your Committee will you kindly return it.

I remain, my Dear Sir,

Very truly yours,

D. STEWART.

*10th April*, 1839.

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## No. 84. (A)

*Table shewing the Hindoo Population, and Mortality in each Police Division and Thannah of Calcutta, for the year 1837.*

I. Division.

| Number. | Names of Thannahs. | Population. | | Mortality. | | Per centage Mortality. | | General Per centage Mortality. |
|---|---|---|---|---|---|---|---|---|
| | | Above 20 | Under 20 | Above 20 | Under 20 | Above 20 | Under 20 | |
| 1 | Saum Bazar, ...... | 6201 | 1393 | 142 | 118 | 2·27 | 8·47 | 3·42 |
| 2 | Baug Bazar, ...... | 3806 | 1274 | 43 | 29 | 1·12 | 2·27 | 1·41 |
| 3 | Shampooker, ...... | 7799 | 4617 | 341 | 288 | 4·37 | 6·23 | 5·07 |
| 4 | Churrukdangah, .... | 3454 | 1207 | 88 | 40 | 2·54 | 3·31 | 2·74 |
| 5 | Jorasanko, .... .... | 3373 | 1495 | 170 | 101 | 5·04 | 6·75 | 5·56 |
| 6 | Symlah, ........... | 5994 | 3286 | 248 | 251 | 4·13 | 7·63 | 5·37 |
| 7 | Sukeas Street, .... | 4627 | 2230 | 145 | 128 | 3·13 | 5·73 | 3·98 |
| 27 | Coomartolly, ...... | 3657 | 980 | 120 | 91 | 3·28 | 9·28 | 4·55 |
| 28 | Hautkhollah, ...... | 7655 | 2468 | 236 | 142 | 3·08 | 5·75 | 3·73 |
| 29 | Jora Baug, ....... | 7903 | 2582 | 267 | 100 | 3·37 | 3·87 | 3· 5 |
| 30 | Cubberdangah, .... | 4390 | 2238 | 113 | 43 | 2·57 | 1·92 | 2·35 |
| 31 | Susteetollah, ...... | 3301 | 741 | 72 | 16 | 2·18 | 2·15 | 2·17 |

## No. 84. (A) *Continued.*

### II. Division.

| Number. | Names of Thannahs. | Population. Above 20 | Population. Under 20 | Mortality. Above 20 | Mortality. Under 20 | Per centage Mortality. Above 20 | Per centage Mortality. Under 20 | General Per centage Mortality. |
|---|---|---|---|---|---|---|---|---|
| 8 | Puttledangah,..... | 5095 | 1703 | 159 | 129 | 3·12 | 7·51 | 4·23 |
| 9 | Thuntuneah,...... | 4098 | 957 | 84 | 83 | 2·05 | 8·67 | 3· 3 |
| 10 | Matchoo Bazar, ... | 2741 | 1364 | 142 | 93 | 5·18 | 6·73 | 5·72 |
| 11 | Colootollah,...... | 2290 | 762 | 145 | 79 | 6·24 | 10·3 | 7·83 |
| 12 | Chunamgolly, .... | 421 | 117 | 9 | 4 | 4·22 | 3·41 | 2·40 |
| 13 | Mirzapore, ........ | 1878 | 1131 | 102 | 92 | 6·78 | 8·13 | 6·44 |
| 14 | Moocheeparah,.... | 510 | 233 | 11 | 10 | 2·15 | 4·24 | 2·82 |
| 15 | Loll Bazar, ...... | 1272 | 218 | 71 | 27 | 5·58 | 12·3 | 6·57 |
| 32 | Burro Bazar,...... | 10890 | 993 | 335 | 125 | 3·07 | 12·5 | 3·87 |
| 34 | Amrahtollah,...... | 533 | 474 | 10 | 3 | 1·85 | ·63 | 1·29 |
| 35 | Clive Street,...... | 808 | 16 | 17 | 3 | 2·10 | 18·7 | 2·42 |
| 36 | Loll Diggee,...... | 255 | 2 | 12 | 7 | 4·30 | | 7·39 |

### III. Division.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 16 | Shibtollah. ....... | 1574 | 705 | 26 | 5 | 1·65 | ·70 | 1·36 |
| 17 | Gooreatollah...... | 2093 | 381 | 145 | 98 | 6·92 | 2·30 | 9·82 |
| 18 | Puddopooker,...... | 1042 | 147 | 145 | 79 | 13·8 | 53·7 | 10·88 |
| 19 | Chandney Choke,.. | 2920 | 361 | 26 | 11 | ·88 | 3·04 | 1·18 |
| 38 | Larkins Thannah.. | 1236 | 17 | 2 | 1 | ·16 | 5·88 | ·23 |
| 39 | Chaundpaul....... | 318 | | 8 | | 2·51 | | 2.51 |

### IV. Division.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 20 | Talltollah,........ | 4470 | 1519 | 96 | 43 | 2·14 | 2·77 | 2·30 |
| 21 | Jaun Bazar,...... | 4560 | 1102 | 121 | 46 | 2·54 | 4·17 | 2·95 |
| 23 | Colingah, ........ | 2428 | 1493 | 25 | 14 | 1·02 | ·93 | ·99 |
| 24 | Chowringhee, ..... | 892 | 433 | 14 | 3 | 1·56 | ·69 | 1·28 |
| 25 | Shorts Bazar,..... | 1464 | 419 | 17 | 1 | 1·16 | ·23 | ·95 |
| 26 | Bramun Busty,.... | 592 | 216 | 13 | 1 | 2·18 | ·45 | 1·74 |

### TOTAL OF FOUR DIVISIONS.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| I | First Division,.... | 62160 | 24511 | 1985 | 1347 | 3·19 | 5·49 | 3·84 |
| II | Second Division,.. | 30794 | 7970 | 1097 | 655 | 3·56 | 8·20 | 4·51 |
| III | Third Division,.... | 9183 | 1611 | 352 | 194 | 3·83 | 12· | 5· |
| IV | Fourth Division.... | 14406 | 5212 | 290 | 109 | 4·64 | 6·76 | 2· |
| | | 116521 | 39394 | 3724 | 2305 | 3·19 | 5·85 | |
| | | 155915 | | 6029 | | 3·86 | | |

## No. 84. (A) (*Continued.*)

NOTE.—The population of Calcutta here taken, is that of 1837, as published by Captain Birch, which assigns the number of Hindoo inhabitants "living" that year within the Town jurisdiction, and their ages above and under twenty. The mortality is taken from the registers, kept during the same year by the Native Superintendents at each of the two public ghats, where alone the Hindoos are permitted to dispose of their dead. These registers are in the Bengallee language, and state in detail the name, age, sex, caste, occupation, and residence, of every deceased individual, also the illness causing death, the duration of illness, and the name of the nearest relative or other person who attends the funeral. The translated official copies of these registers kept for record at the Police Office, enumerate however only the actual number of bodies, "burned," or "floated," at each ghat for every month, and these records of course comprehend many who died in the Suburbs, and who were not included in the census of the Town. The estimate therefore of Hindoo mortality formed from such data is necessarily greater than the reality. For example, in 1837, the number of Hindoo bodies disposed of at the ghats was 7070, whereof only 6029 were actual residents of Calcutta; the remainder being passengers or dwellers beyond the Mahratta Ditch. The true rate of mortality, therefore, for 1837 is 3·86 per cent.; and as that year was one of ordinary health, this is in all probability a fair statement of the average annual mortality of the Hindoo Calcutta population. The present Table is meant to exhibit the annual rate of mortality among the Hindoo population in each Division and Thannah of the Town, and by comparison, the relative healthiness and unhealthiness of these localities. To correspond with the census, the rates of mortality above and below the age of twenty are also given. These are found to vary in a way quite unaccountable to me: the total exhibits a mortality above 20 of 3·19; and under 20 of 5·86; and the total Hindoo mortality is 3·86 per cent.

Were the papers above referred to, translated and tabulated for a series of years, they would furnish, I imagine, more full and definite information than is afforded by the records of mortality of any city or community which I am acquainted with, excepting those of the Army and of Foundling Hospitals. So inquisitorial a research indeed could not probably be instituted at the present day in any European city, but at many of the great towns of Bengal, such as Allahabad, Dacca, Dinapore, Benares, Moorshedabad, Gazeepore, &c. nothing could be easier, and not the smallest objection would be found to arise on the part of the natives, nor any difficulty in collecting similar data at all of them from which to ascertain with mathematical accuracy the influences of seasons, localities, particular diseases, age, sex, caste, and occupation upon the public health in each and thereby to enable inquirers into such matters to compare the results with those in this and other cities along the banks of the sacred River.

D. STEWART, M. D.
*Supt. General of Vaccination*

CALCUTTA,
*10th April*, 1839.

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## No. 85.

TO THE HONBLE SIR J. P. GRANT,

*Chairman of the Fever Hospital and Municipal Committee, &c. &c. &c.*

MY DEAR SIR,—The accompanying Table is, I trust, still in time to be of some use, although it does not exhibit, as I hope at some future time to do, the average duration of each disease, and the occupations and castes of the victims. No registers of the sort are kept at the Mahomedan burying grounds, but I hope to be able to establish them. Among the Christian population, the attempt would, I fear, be vain.

I remain, my dear Sir,
Very truly yours,
(*Signed.*) D. STEWART.

*23rd April*, 1839.

*Table shewing the Diseases causing death, and the respective ages of the deceased, in 20,000 cases of Hindoo mortality, within the Town of Calcutta, during the years 1834-35-36-37-38.— Translated and tabulated from the records of the Ghâts.*

| Age from birth to | Fevers. | | | | Disease of Digestive Organs. | | | | | | Disease of Respiratory Organs. | | Disease of Nervous System. | | | Disease of General System. | | | | Accidents and anomalous disease. | | Total of each Sex. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Simple. | Intermittent. | Typhus. | Eruptive. | Diarrhœa & Dysentery. | Cholic. | Disease of the Rectum. | Disease of Liver. | Spleen disease. | Cholera. | Cough. | Asthma. | Paralysis. | Epilepsy. | Tetanus. | Rheumatism Gout. | Diabetes Dropsy | Syphilis. | Leprosy. | Death by hanging. Do. by drowning. Do. by falling. Do. by snake bite. Inflammation of the knee joint. Spontaneous hemorrhage. | Diseases of lying-in Women and their Children. | Males. | Females. | Total. |
| 1 year | 25 | 3 | 248 | 41 | 126 | 0 | 0 | 0 | 5 | 86 | 6 | 1 | 0 | 8 | 2 | 0 | 2 | 0 | 1 | 10 | 1,237 | 983 | 818 | 1801 |
| 2 „ | 12 | 2 | 138 | 21 | 195 | 0 | 0 | 1 | 12 | 75 | 6 | 0 | 0 | 1 | 3 | 1 | 9 | 0 | 0 | 10 | 3 | 254 | 235 | 489 |
| 3 „ | 7 | 11 | 149 | 26 | 196 | 0 | 1 | 1 | 12 | 78 | 1 | 0 | 0 | 3 | 5 | 3 | 8 | 2 | 0 | 6 | 0 | 274 | 235 | 509 |
| 4 „ | 8 | 4 | 75 | 30 | 127 | 0 | 0 | 0 | 5 | 75 | 2 | 0 | 0 | 0 | 1 | 4 | 1 | 0 | 0 | 2 | 0 | 181 | 149 | 330 |
| 5 „ | 4 | 3 | 106 | 32 | 101 | 0 | 0 | 0 | 6 | 72 | 0 | 1 | 0 | 2 | 4 | 1 | 0 | 3 | 0 | 12 | 0 | 224 | 126 | 350 |
| 6 „ | 5 | 0 | 56 | 21 | 75 | 0 | 0 | 0 | 7 | 56 | 3 | 2 | 2 | 0 | 2 | 0 | 2 | 0 | 0 | 2 | 0 | 141 | 92 | 233 |
| 7 „ | 4 | 3 | 59 | 17 | 65 | 0 | 0 | 0 | 9 | 57 | 1 | 0 | 1 | 0 | 3 | 2 | 3 | 0 | 0 | 7 | 0 | 112 | 119 | 231 |
| 8 „ | 2 | 4 | 41 | 16 | 63 | 0 | 0 | 0 | 6 | 46 | 2 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 91 | 94 | 185 |
| 9 „ | 0 | 0 | 49 | 17 | 44 | 1 | 0 | 2 | 6 | 30 | 2 | 1 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 9 | 0 | 104 | 61 | 185 |
| 10 „ | 3 | 4 | 58 | 15 | 65 | 3 | 2 | 0 | 10 | 53 | 4 | 1 | 0 | 0 | 4 | 3 | 0 | 0 | 2 | 2 | 0 | 141 | 88 | 229 |
| 11 „ | 6 | 3 | 45 | 13 | 20 | 1 | 0 | 0 | 8 | 34 | 0 | 0 | 1 | 0 | 3 | 0 | 2 | 0 | 0 | 3 | 0 | 88 | 55 | 139 |
| 12 „ | 3 | 6 | 75 | 24 | 59 | 0 | 0 | 3 | 16 | 66 | 2 | 2 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 9 | 0 | 150 | 120 | 270 |
| 13 „ | 2 | 3 | 34 | 11 | 13 | 0 | 0 | 0 | 12 | 36 | 4 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 1 | 3 | 4 | 79 | 48 | 127 |
| 14 „ | 5 | 11 | 70 | 7 | 50 | 1 | 0 | 0 | 13 | 44 | 4 | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 0 | 5 | 2 | 122 | 96 | 218 |
| 15 „ | 3 | 1 | 63 | 14 | 32 | 0 | 0 | 0 | 8 | 58 | 5 | 2 | 5 | 2 | 1 | 1 | 2 | 1 | 1 | 4 | 6 | 129 | 80 | 209 |
| 20 „ | 28 | 45 | 551 | 65 | 365 | 17 | 10 | 2 | 55 | 466 | 70 | 9 | 11 | 0 | 9 | 14 | 8 | 5 | 6 | 31 | 8 | 1,131 | 645 | 1,776 |
| 30 „ | 45 | 41 | 1,037 | 81 | 761 | 8 | 1 | 4 | 47 | 1,293 | 185 | 12 | 5 | 6 | 31 | 11 | 13 | 11 | 7 | 25 | 37 | 2,672 | 998 | 3,670 |
| 40 „ | 46 | 36 | 817 | 17 | 717 | 22 | 3 | 4 | 17 | 896 | 125 | 23 | 5 | 5 | 8 | 35 | 12 | 10 | 5 | 64 | 26 | 1,995 | 898 | 2,893 |
| 50 „ | 21 | 29 | 509 | 8 | 594 | 9 | 2 | 7 | 12 | 600 | 98 | 9 | 8 | 0 | 11 | 10 | 19 | 2 | 5 | 31 | 2 | 1,326 | 661 | 1,987 |
| 60 „ | 22 | 29 | 412 | 2 | 557 | 14 | 6 | 3 | 7 | 308 | 52 | 15 | 12 | 5 | 4 | 23 | 17 | 2 | 4 | 43 | 3 | 970 | 570 | 1,540 |
| 70 „ | 7 | 15 | 206 | 4 | 363 | 2 | 0 | 1 | 5 | 153 | 29 | 13 | 7 | 0 | 2 | 10 | 19 | 3 | 2 | 14 | 0 | 463 | 392 | 855 |
| 80 „ | 17 | 12 | 227 | 4 | 621 | 4 | 2 | 5 | 0 | 137 | 59 | 15 | 20 | 2 | 12 | 15 | 2 | 5 | 4 | 13 | 0 | 511 | 665 | 1,176 |
| 90 „ | 3 | 6 | 66 | 2 | 229 | 1 | 0 | 0 | 0 | 36 | 10 | 8 | 4 | 0 | 0 | 8 | 3 | 0 | 2 | 0 | 0 | 148 | 230 | 378 |
| 100 „ | 4 | 1 | 27 | 0 | 171 | 2 | 0 | 0 | 0 | 16 | 2 | 5 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 2 | 0 | 62 | 178 | 240 |
| Total, .. | 282 | 272 | 5,118 | 488 | 5,620 | 86 | 27 | 33 | 278 | 4,773 | 672 | 120 | 83 | 36 | 114 | 147 | 128 | 45 | 41 | 309 | 1,328 | 12,347 | 7,653 | 20,000 |
| | | 6.160 | | | | | 6.044 | | | 4,773 | 792 | | | 233 | | | 361 | | | 309 | 1,328 | | | |

## No. 85. (B)

NOTE.—This table, like the former, is compiled from the original Bengalee registers kept at the river ghauts, where Hindoo dead bodies are disposed of; unhappily these have not been preserved at more than one ghaut, except for the year 1837. The object, however, being in the present instance to ascertain what are the most common diseases causing death among the town population, and in what respect the mortality caused by each disease is affected by circumstances of age, and sex, the above deficiency is not much to be regretted; for the extent of the series, and its range over a period of nearly five years, obviates any objection which might be taken to its general applicability on the supposition of a peculiar epidemic influence during particular seasons, or the special unhealthiness of any locality.

The deaths recorded have of course all happened either within the town, or in its immediate suburbs; and the inquiry was simply, in any number of deaths thus occurring, first, how many are attributable to particular diseases; second, how many deaths occur at each period of life; and, third, at what age does each disease prove most fatal: a fourth subordinate inquiry regarded the mortality of the sexes generally.

To complete the number of 20,000, commencing with the earliest registers procurable, viz. from 4th June, 1834, we have for that year 3,503; for 1835, 4,164: for 1836, 3,191, all at one ghaut; for 1837, 7,070, at two ghauts; and for one month of 1838, 2,072.

In attempting to classify the multifarious diseases of the Bengallee nomenclature, much difficulty was found in obtaining the true meaning of many of the terms employed. I am indebted to friends for the explanations given of most, and have only to add that the theoretical and fanciful distinctions, founded on an exploded humoral pathology, or supposed malignant influences, are so numerous, as to make any closer approximation to pathological accuracy in the translation impossible. The physiological classification of diseases which I have adopted renders, however, a minute adherence to the original names unnecessary, as it exhibits with sufficient fullness the specific range of all the prevailing endemic, and epidemic diseases.

Enumerated in the order of their fatality, we find that Fevers and Dysenteries hold the first, and a nearly equal place, in the catalogue, conjointly carrying off more than half the population: Cholera stands next in the scale, and as a scourge of population, is little inferior to either of the former; but the most remarkable feature in the table, and that for which I was least prepared, is the mortality of child-bed, which is fourth in the scale. The term employed to include all accidents of this nature, and applied indiscriminately to the infant and the mother (*antari rog*) is one which attributes the fatal termination of such cases to demoniacal influence. It is never applied to casualties after the 7th day, and we may therefore conclude that the picture here given, distressing though it be, does not exhibit the total amount of suffering and of death caused by the barbarity, ignorance, and prejudices, of the Hindoos in their management of lying-in women. The number of still-born children is not given, at all nor is it, I fear, ascertainable. The picture is sufficiently frightful, which shows as matter of fact that of 1801 children who died during the first year of life, 1,237 were sacrificed in the birth. Of 88 mothers who lost their lives in child-bed, four appear to have been so young as thirteen, two aged fourteen, six aged fifteen, and eight died between the ages of fifteen and twenty.

Diseases of the Respiratory organs hold the next prominent place in the catalogue. Contrary to general observation in cold climates, these appear in Bengal to find their victims about middle life, an observation which, if confirmed, would furnish room for interesting inquiry into its cause.

Disease of the general system, spleen, dropsies, liver diseases, &c., are not more common than might be expected as sequelæ to the frightful catalogue of concentrated fevers,

# No. 86.

No. 1065.

From SURGEON JAMES HUTCHINSON,

*Secretary to the Medical Board,*

To THE HONBLE. SIR JOHN P. GRANT,

*Chairman Municipal Committee.*

*Fort William, 15th April,* 1839.

Sir,

In compliance with the request contained in your Letter dated the 26th February last, I have the honour, by direction of the Medical Board, to forward to you a Return of the admissions and deaths in the Hospital of the European Regiments in Garrison in Fort William, from 1808 to 1837, prepared, as requested, in a similar manner to that already furnished* of the Presidency General Hospital.

I have the honour to be,

Sir,

Your most obedient servant,

J. HUTCHINSON,

*Secretary Medical Board.*

* Vide page, 159

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## No. 86. (A)

*Comparative Statement of admissions and deaths among the European Troops (King's and Company's) in the Garrison of Fort William for the following years.*

| Years. | In Hospital on the 1st January of each year, & admissions during the year. | Died. | Ratio per cent. of deaths to admissions. |
|---|---|---|---|
| 1808, | 3,700 | 120 | N.B. During this period the H. Co's. Artillery were quartered in the Fort, previous to their removal to Dum Dum. |
| 1809, | 3,730 | 67 | |
| 1810, | 2,849 | 46 | |
| 1811, | 2,089 | 64 | |
| 1812, | 2,548 | 68 | |
| | 14,916 | 365* | $2\frac{45}{100}$ |
| 1813, | 1,394 | 35 | |
| 1814, | 1,704 | 30 | |
| 1815, | 1,805 | 31 | |
| 1816, | 1,789 | 60 | |
| 1817, | 2,169 | 44 | |
| | 8,861 | 200 | $2\frac{2}{105}$ |
| 1818, | 2,629 | 83 | |
| 1819, | 2,339 | 105 | |
| 1820, | 1,163 | 53 | |
| 1821, | 2,224 | 76 | |
| 1822, | 2,183 | 62 | |
| | 10,538 | 279 | $2\frac{64}{100}$ |

## No. 86. (A) *Continued.*

*Comparative Statement of admissions and deaths among the European Troops (King's and Company's) in the Garrison of Fort William for the following years.*

| Years. | In Hospital on the 1st January of each year, & admissions during the year. | Died. | Ratio per cent. of deaths to admissions. |
|---|---|---|---|
| 1823, | 3,001 | 68 | |
| 1824, | 2,268 | 99 | Burmese War. |
| 1825, | 2,542 | 110 | |
| 1826, | 2,355 | 175 | |
| 1827, | 1,388 | 52 | |
| | 11,554 | 504 | $4\frac{27}{100}$ |
| 1828, | 2,076 | 49 | |
| 1829, | 2,025 | 69 | |
| 1830, | 2,387 | 98 | |
| 1831, | 1,346 | 60 | |
| 1832, | 1,166 | 56 | |
| | 9,000 | 332 | $3\frac{68}{100}$ |
| 1833, | 1,422 | 63 | |
| 1834, | 1,273 | 54 | |
| 1835, | 1,473 | 37 | |
| 1836, | 1,290 | 25 | |
| 1837, | 919 | 26 | |
| | 6,377 | 205 | $3\frac{21}{100}$ |
| 1838, | 776 | 22 | $2\frac{83}{100}$ |

*Presidency General Hospital.*

| | | | |
|---|---|---|---|
| 1838, | 716 | 65 | $9\frac{7}{100}$ |

## No. 87.

To THE HONBLE. SIR J. P. GRANT.

DEAR SIR,

I have been unable to find in the several memoirs of Dr. Jackson any special details of his plan of Hospital management, the said memoirs being confined chiefly to enumerations of his several works. It would appear, however, that very early in life Dr. Jackson discovered that the means which sick men require, exclusive of medicine and Hospital equipment, rarely calls for any extra expense. The 71st Regiment with which this celebrated physician commenced his career, and which shared the most active parts of the war in America in 1778, had on various occasions a very numerous sick list, but the men were kept away from the moral and physical contamination of the General Hospitals,

then and on all occasions the sources of enormous injury to the troops. Under Dr. Jackson the men were treated in the Regimental Hospitals, and "no expense was incurred on account of the sick, and the loss of men was inconsiderable."

"Good soldiers," says Dr. Jackson, "are generally unwilling to go to General Hospitals; and good Surgeons are unwilling to separate good soldiers from their comrades."

With the 3d Regiment (Buffs) Dr. Jackson adopted the same regimental plan, and he describes his men's position as "enviable as contrasted with that of the sick in General Hospitals, and the mortality bore no proportion."

I shall now proceed to make such extracts in detail, relating to Dr. Jackson's system of Hospital finance, as my notes can furnish; premising, that a weekly examination of Hospital accounts formed a fixed rule with him. "It is," he says, "a step towards system and economy, in short, a rule to prevent abuse. It serves to furnish a concise and connected voucher for the settlement of accounts at a future time; and so far it is useful." The same plan he recommends to be extended to the money accounts of Hospitals, as security against the possibility of fraud—the ordinary mode of auditing accounts being viewed by him as a mere ceremony.

"The author of this work," he says, "had been aware of the evils of indulging, or rather of loading, sick persons with superfluous quantities of meat and drink, from an early period of life. He had seen the mischief of excess, and the advantages of correct measure in considerable fields of experience. Instructed therefore, of what is right by his own observation, he has generally, where intrusted with a medical charge in the army, required a commuted ration, estimated *ad valorum*, as the means of Hospital subsistence; or, a sum equivalent to the value of the ration, or to the usual mess contribution, as supplying those means at the market. Such is the rule, and he has the satisfaction to add that his calculation is found, on trial, to be capable of answering the useful purpose in all ordinary cases of sickness among military subjects. He has seen it proved regimentally in variety of service: he saw it proved generally in St. Domingo among troops of different descriptions in the year 1797; it was proved in the example of the Russian Auxiliary force, which was sent to act with the British troops in the year 1799; it was adopted and proved more decidedly at the British Army depôt in the year 1801, under circumstances as untoward as any that are likely to occur in any service. The diet and every other refreshment at the depôt was abundant, and of the best kind; the expense of it, and of every other thing which the conditions of the sick required, was defrayed at a sum somewhat under ten pence per man. The rule acted upon in this case was formed from preceding experience. It was now proved on trial, so as to appear demonstrative in all its parts."

At the time Dr. Jackson entered the army, according to Dr. Barnes, the full diet of a sick soldier was a pound of beef more daily than for a soldier on duty—than which nothing could be more absurd. Dr. Jackson's system effectually shut the door on this, as on many other abuses, until there occurred no provision of extra means in the army estimates on account of Hospital expenses; and all this, while he kept his men out of the sinks of moral and physical depravation—the General Hospitals—so as to prove both economical and effective of military purpose.

As to details, Dr. Jackson estimates seven pence as the value of Hospital breakfast, dinner, and supper, for the whole on an average. It follows, therefore, that out of the ten pence per man of daily Hospital stoppages, three pence remains to cover extra articles, wages of servants, washing, &c.

A reference to my former letters will shew how effectually all these purposes, and even more, have been effective in the British Military Hospitals all over the world—the East Indies excepted, and there the plan has not yet been tried.

To conclude. The Hospital management of the Medical Department of this Army cannot be expected to improve until the officers, both medical and military, are made better acquainted with its principles of arrangement, and with Hospital finance especially, as in the British army.

To the Surgeon such knowledge is necessary, and to the Regimental officer it ought to be no less one of duty: he is the person on whom the soldier looks as his guardian under all and every circumstance. All the money matters of the soldier ought to be intimately known and supervised by the officer. The visits of humanity and kindness paid by the military officer to the Hospital are likewise of vast importance, scarcely less so than the same qualities in those of the Surgeon himself. Neither is the duty an ungrateful one to the military officer, for it brings him the respect and attachment of the soldier, who is seldom an ungrateful man.

These moral influences are strongly insisted on by Dr. Jackson, who justly considers, that without them duty degenerates into mechanical routine.

"Whether with the medical or military officer," he says, "the heart must be warm with charity, the mind firm in knowledge; for no class of men are more dexterous in probing the rotten parts of the heart, or in unmasking the weak mind of their superior, than the mass of common soldiers."

This noble minded physician considers the connexion between all classes of officers and the soldier of so intimate a nature, that it must by every means be cherished in practice. "The physician restores the sick soldier to health; the military officer witnesses the process—he is in some degree master of the means, and he is the judge of the effect. The soldier who is comforted by the words of friendship as he lies feeble and dejected in the Hospital bed, gives courage to his arm in the field when restored to the vigour of health, conquers like a hero, or falls by the side of his officer and friend—his wounds in front and his face towards the enemy."

By the few who are aware of the vital importance of the health concerns of an army to its military efficiency, the rigid performance of the duties of Hospitals will not only be appreciated, but the mode and manner of performing them will be viewed as of no secondary consequence.

It is on this comprehensive ground that Dr. Jackson stands prominent, not alone as an unequalled Military Physician, but likewise as one who has gone deeper than any modern writer into a just estimate of the various active and intelligent powers of man, in his various relations, and with a view to the purposes of war.

Yours very truly,

NATIVE HOSPITAL, *(Signed)* J. R. MARTIN.

*April* 30*th*, 1839.

NOTE.—It would appear that previously to 1803 the daily sum of six pence only was deducted from the sick soldier as Hospital stoppage, but that by Regulations promulgated in that year, an increased sum of ten pence per day was henceforward ordered—the discretional allowance previously granted for contingencies being annuled.

"The sum of ten pence per man is proved in every fair trial to be equal to the provision of every necessary article of food and refreshment; even equal to defray the cost of care and nursing, according to the plan recommended in this place; even according to the plan now acted on regimentally through the whole extent of the British army in England. The money to be allotted in the army estimates as Hospital expenses is thus supposed to be confined to the original cost, and occasional repair of furniture and equipments, the cost of medicine and salary of Medical Staff, with some extra expense in fuel and candles. The common expense of subsistence and attendance is defrayed by the deduction made from the soldier's daily

pay, during his confinement in Hospital; which, in order that things be justly balanced through all parts of the service, is so calculated as to be equivalent to the expense which he incurs on account of messing and washing while in barracks or camp. His condition as a soldier is thus relatively preserved; his needs in health or sicknesss principally supplied by his own means."

Why it is that the rate of Hospital stoppage in India is so low in comparison to that exacted in all other countries, I do not know; but there would appear to be good reasons, other than the great saving to Government, for making it equal to ten pence per day; I mean with reference to the moral and physical welfare of the British soldier in India, whose misuse of the money left at his disposal is well known to be a general cause both of crime and of disease.

J. R. MARTIN.

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## No. 88.

To THE HONBLE. SIR J. P. GRANT,

*Chairman of the Fever Hospital and Municipal Improvement Committee.*

DEAR SIR,

I beg to call your attention, before concluding your Report, to a subject of vast importance to the well-being of Hospitals, namely, their due proportion of Officers. From a recent report by the Rev. Charles Oxenden, it would appear, that exceeding abuses and neglect occur in various of the English charitable Institutions in this respect; and that, while four Medical Officers had care of 99 beds at Leicester, of 100 beds at Northampton, of 170 beds at Gloucester; the same number of Officers were appointed at Hereford to attend on 52 beds, and at Bury upon 50 only. Again, while *six* Medical Officers were deemed ample for 105 beds at Norwich, for 107 at Salisbury, for 124 at Leeds, and for 150 at Shrewsbury; six were also required for the charge of 85 beds at Sheffield, of 79 at Derby, of 65 at Canterbury, and of 62 at Bath. The recitals here given by one of the ablest benefactors of British charitable Institutions must be taken as instances of great abuse. I shall now proceed to lay before you the scale which Mr. Oxenden considers as suitable, merely stating my opinion that, even within the tropics, the proportion of Officers is so liberal as to allow of no one Officer being over-taxed with duty.

Proposed number of Medical Officers for an Hospital, containing from

| | | | | |
|---|---|---|---|---|
| 1 bed to | 75—say, | 1 Physician, | 1 Surgeon, | 1 House Surgeon. |
| 76 | 125 | 2 | 2 | 1 |
| 126 | 175 | 3 | 3 | 1 |
| 176 | 200 | 4 | 4 | 1 & 1 House Apothecary. |

Mr. Oxenden considers that in general a Physician should have 20 per cent more cases than a Surgeon, by which he means sixty to forty: if therefore he has in the Table equalized the number of Physicians and Surgeons, it is on the belief that upon an average of Hospital cases, In-patients and Out-patients together, there will be nearly 300 Medical, to 200 Surgical patients.

Mr. Oxenden's reasons for considering his scale a just one, are as follow:—

"1st. I believe that the greater the responsibility devolving upon any one* Medical Officer, the more sensible will he be of the importance of his situation with reference to the

* Although for two or three conflicting reasons I should be sorry to rid the Provincial Hospitals altogether of what are falsely called the gratuitous services of the Surgeons of the neighbourhood, nevertheless I do not hesitate, at the risk of giving unintentional offence, to record my conviction, that, with one or two exceptions in favour of the larger towns, our Institutions would be much better conducted, and the patients far more satisfactorily

Institution, and the value of his professional preference by the public; each of which will not fail to stimulate to a zealous discharge of his duties, and to an anxious desire to retain the confidence of the Governors.

"2nd. I believe that disease can no where be so well studied as in the Wards of an Hospital; and that *cæteris paribus*, the degree of skill attainable by any one individual will be proportionate to the number of cases under his own treatment. (I speak only of intelligent and observant practitioners. Experience will do little for the rest.)

"3rd. I believe that the interest, which a really scientific man takes in his profession, will vary with the opportunities afforded to him of gratifying his thirst after increased science; and, therefore, that the more beds he has to attend, the greater will be his interest in their results.

"4th. I believe that if a Physician or Surgeon have twenty or thirty beds occupied by various forms of disease, he will be more disposed to attend frequently, (if not daily,) than if only five or ten beds were under his charge; because in the one instance he will always have some cases possessing morbid interest, and, therefore, professionally repaying him for his attendance; while in the other, the probability of such cases will be so reduced as often to furnish a silent excuse for deferring a visit to the Hospital, until a more convenient season.

"5th. I believe that it is of considerable importance that the operations should be limited to as few hands as possible, in order to insure a greater degree of skill (if not to avoid positive unskilfulness) at the table.

"6th. I believe that the difficulty in some Hospitals, of effecting satisfactory attendance, generally; and of obtaining periodical and occasional bona fide* consultations, in particular; would be materially lessened, if not entirely removed, by a diminution in the number of Medical Officers.

"7th. I believe that, in small provincial towns, the number of resident Surgeons really qualified by experience, education, and professional spirit, to succeed to an Hospital appointment, is necessarily fewer than in the large manufacturing towns, although the Hospitals of the former have a large proportion of Medical Officers. And therefore, that the small town of Bury, for instance, cannot keep up a satisfactory supply of three Hospital Surgeons, or Canterbury of four: as surely as Leeds or Nottingham can furnish three, or Birmingham four, or even Manchester six."

Yours very truly,

J. R. MARTIN.

NATIVE HOSPITAL.
*24th April*, 1839.

attended, and the operations more successfully performed, by one highly salaried Resident Surgeon, of acknowledged skill, than by any number of local practitioners. I need scarcely add, that the great superiority of Surgical science and operative skill in London over that of the provinces, is a sufficient reason for limiting this remark to the latter localities.

* I could name at least one Hospital where Physicians have held satisfactory consultations periodically and p. r. n., while the consultations by the more numerous Surgeons have been, and still are, a disgrace to the Institution to which they belong, as well as to themselves. They exist but in name. When will Governors awake from their slumber, become enlightened, and do their duty?

# No. 89.

## *Statement of the Fever Hospital Funds on the 1st May, 1839.*

### 1835-36.

| | Co's. Rs. A. P. |
|---|---|
| Native Donations Subscribed from 20th May 1835, up to 31st May 1836.. .. .. .. .. .. .. .. .. | 32,941 12 9 |
| Ditto, .. Ditto, paid up to Ditto, (including Co's. Rs 106 10 8 paid into Union Bank by Ramlochun Ghose, vide Bank Book 10th May, 1836. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. | 21,228 0 0 |
| Unpaid of this year Co's. Rs. | 8,716 12 9 |

### 1836-37.

*Native Donations and Subscriptions subscribed from 1st June 1836, to 30th April, 1839*
*Vizt.*

| | Donations | Subscriptions | Co's. Rs. A. P. |
|---|---|---|---|
| By deductions from Christian List as per Subscription Book No. 2 up to 31st December 1836. .. .. .. .. .. .. .. .. .. .. .. .. | 32 0 0 | 1 0 0 | |
| Ditto from Ditto per S. B. No. 3. from 1st January, 1837 to 30th April 1839. | 10 0 0 | 0 0 0 | |
| Agency Houses,' Presses' &c. Lists (Deducting the duplicate receipt for Rs. 100 erroneously made in consequence of Hullodhur Mullick signing his name in two distinct Sub. Books ) .. .. .. .. .. .. .. | 1,523 0 0 | 88 0 0 | |
| Total,.... | 1,565 0 0 | 89 0 0 | 1,651 0 0 |
| | | | 10,370 12 9 |

*Native Donations and Subscriptions paid from 1st June to 31st December, 1836.*

| | Donations | Subscriptions | Co's. Rs. A. P. |
|---|---|---|---|
| (Including, Co's. Rs 1,066-10-8 in Bank Book of 29th June, 1836, on account of Prosonnocomar Tagore.).. .. .. .. .. .. .. .. .. .. .. | 2,211 0 0 | 0 0 0 | |
| Ditto, .. .. paid from 1st January, 1837 to 30th April, 1839, .. .. .. | 2,265 5 0 | 50 0 0 | |
| | 1,509 5 0 | 50 0 0 | 4,559 5 0 |
| Amount of Native Donations and Subscriptions up to 30th April, 1839, Unpaid,.... | | | 5,811 7 9 |

| *Christian Donations and Subscriptions,* | *Donations.* | | *Subscriptions* | | Co's. Rs. A. P. |
|---|---|---|---|---|---|
| Subscribed from 1st June to 31st December, 1836, as per Subscription Book No 3. .. .. .. .. | 6,173 0 0 | | 2,114 0 0 | | |
| Ditto From 1st January 1837 to 30th April 1839, (Deducting the Receipt for a Donation of 10 Rs made in error caused by a Dupt.signature of T. H. Gardiner's being taken for that of H. B. Gardiner's and *excluding* the 20 Rs. for the 1st Five Quarters of the Second and Third year's Annual Subscription of R. W. Allan, as credited by him in the Union Bank, and for which no office receipt has been given or made, | 959 10 8 | | 106 0 0 | | |
| Ditto From 1st January, 1837 to 30th April, 1839, as per Agency Houses,' Armenians' and Presses' Lists. .. .. .. .. .. .. .. .. .. .. | 3,261 0 0 | 10,396 10 8 | 198 0 0 | 2,718 0 0 | 13,114 10 8 |
| | | | | | 18,926 2 5 |
| Christian Donations and Subscriptions paid from 1st June to 31st December, 1836, .. .. .. .. .. | 1,910 0 0 | | 1,715 0 0 | | |
| Ditto, ditto, ditto, 1st January, 1837 to 30th April, 1839, | 4,892 10 8 | 9,802 10 8 | 733 0 0 | 2,148 0 0 | 12,250 10 8 |
| Total Amount of Native and Christian Donations and Subscriptions, up to 30th April, 1839, Unpaid,.... | | | | | 6,675 7 9 |

### *Abstract*

| | Co's. Rs. A. P. |
|---|---|
| By Native Donations from 20th May 1835 to 31st May, 1836, .. .. .. .. .. .. .. .. .. .. .. .. | 32,911 12 9 |
| ,, Ditto Ditto, ,, 1st June 1836 to 30th April, 1839. .. .. .. .. .. .. .. .. .. .. .. .. | 1,565 0 0 |
| ,, Ditto Subscriptions ,, Ditto to Ditto, .. .. .. .. .. .. .. .. .. .. .. .. .. | 89 0 0 |
| ,, Christian Donations ,, 1st June 1836 to 30th April, 1839. .. .. .. .. .. .. .. .. .. .. .. | 10,396 10 8 |
| ,, Ditto Subscriptions ,, Ditto to Ditto, .. .. .. .. .. .. .. .. .. .. .. .. .. | 2,718 0 0 |
| Total Amount of Donations and Subscriptions,.... | 47,713 7 5 |
| Add Interest accrued on Ditto up to 31st December, 1838, as per Union Bank Book of 5th March 1839,.. | 3,677 11 10 |
| Total of Donations Subscriptions and Interest,.... | 51,391 6 3 |
| Deduct Amount uncollected up to 30th April, 1839, classed under several heads as follows, .. .. .. .. | 6,675 7 9 |

| | *Native Contributors.* Donations. | Subscrip. | Total. | *Christian Contributors.* Donations | Subscrip | Total. |
|---|---|---|---|---|---|---|
| 1. Payments postponed till the Establishment of the Hospital, | 2,453 5 1 | 11 0 0 | | 21 0 0 | 166 0 0 | |
| 2. Ditto put off from day to day, .. | 3,081 7 5 | 1 0 0 | | 128 0 0 | 51 0 0 | |
| 3. Ditto Doubtful, .... .... | 106 10 8 | 0 0 0 | | 10 0 0 | 8 0 0 | |
| 4. Ditto Refused, .... .... | 26 0 0 | 8 0 0 | | 217 0 0 | 25 0 0 | |
| 5. Parties absent from Calcutta, .. | 93 0 0 | 17 0 0 | | 107 0 0 | 5 0 0 | |
| 6. Ditto not Discovered, .... | 7 0 0 | 0 0 0 | | 20 0 0 | 0 0 0 | |
| 7. Ditto Demised, .... .... | 2 0 0 | 2 0 0 | | 91 0 0 | 15 0 0 | |
| Add 4 pie omitted to be paid by two individuals, .. .... .... | 4 | | | | | |
| | 5,772 7 9 | 39 0 0 | 5,811 7 9 | 591 0 0 | 270 0 0 | 861 0 0 |

| | Co's. Rs. A. P. |
|---|---|
| Interest and Net Collection up to Ditto, .. .... .... .... .... .... .... .... | 44,715 11 6 |
| Deduct office and Bank charges up to 30th April, 1839, .... .... .... .... .... .... | 1,528 2 8 |
| Net Balance in Union Bank,.... | 43,187 11 10 |

J. MORRIS,

*Clerk to the Fever Hospital and Municipal Committee.*

## No. 90.

THE HONOURABLE SIR J. P. GRANT,

*&c. &c.*

MY DEAR SIR,

I am much obliged by the opportunity, which your courtesy affords me, of rectifying the error I appear to have fallen into while stating my belief that the waters of the Hooghly were available for ordinary culinary purposes in Calcutta, at all times of the year.

I fell into the mistake from understanding, that the River water alone was used by the shipping: but as it appears that in certain seasons they are obliged to send for River water to a distance beyond the influence of tides, my assertion must of course be received with this correction, amounting, I presume, to an impossibility.

I return the copies of Draft Report and Evidence which you were kind enough to furnish to me for reference, and remain always,

Very truly yours,

*5th July*, 1838. D. STEWART.

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## No. 91.

THE HONOURABLE SIR J. P. GRANT.

MY DEAR SIR,

I send you the only work I possess on the subject you question me about; its information is very meagre.

I also beg to send you a Table which I copied many years ago from a History of Paris published by Galignani, and to which I have added a note containing all that my memory supplies me with.

I am, my dear Sir,

Yours very truly,

*23rd August*, 1838. D. STEWART.

# No. 91. (A)

*Table shewing the annual average Admissions and Mortality in each of the Paris Hospitals, also the general Receipts and Disbursements of each, and the expense of each patient in* 1820.

*Table of the Hospitals and Hospices of Paris.*

| | Number of beds. | Average number admitted Annually. | | Annual average mortality. | |
|---|---|---|---|---|---|
| | | Men. | Women. | of each Hospital. One out of | of all the Hospitals. One out of |
| Beaujon, .. .. .. | 140 | 770 | 604 | 5·50 | Men, 7·72 Women, 6·97 |
| Saint Louis, .. .. .. | 1,050 | 4,324 | 2,342 | 26·23 | |
| Saint Antoine, .. .. | 250 | 1,216 | 1,041 | 5·50 | |
| Hotel Dieu, .. .. .. | 1,262 | 6,032 | 4,322 | 40·93 | |
| La Pitie, .. .. .. | 600 | 1,282 | 754 | 5·00 | |
| La Charite, .. .. .. | 300 | 2,363 | 390 | 7·80 | |
| Enfans, .. .. .. | 600 | 1,272 | 931 | 4·37 | Boys, 7·22 Girls, 7·02 |
| Necker, .. .. .. | 136 | 561 | 593 | 6·00 | |
| Cochin, .. .. .. | 100 | 604 | 618 | 7·50 | |
| Accouchement, .. .. | 350 | .. | 2,105 | Women, 25; Stillborn children, 22 | Of both sexes and all ages, one out of 7·35 |
| Vénériens (including 100 out-door patients,) .. .. | 650 | 1,448 | 1,345 | Men, 56; Women, 67; Children, 2·50 | |
| Sainte périne, .. .. .. | 175 | .. | .. | .. | Men, 5·70 Women, 7·42 |
| Incurables hommes, .. .. | 450 | .. | .. | 6·82 | |
| Orphelins, 300 boys, 300 girls, | 600 | .. | .. | .. | |
| Ménages, .. .. .. | 614 | .. | .. | 8·50 | |
| Incurables femmes, .. .. | 500 | .. | .. | 8·58 | |
| Enfans trouves, .. .. | 250 | .. | .. | 7·39 | Of both sexes, one out of 6·69 |
| Salpetriere, .. 3,950 paupers, .. 700 lunatics, .. 350 patients, .. .. | 5,000 | .. | .. | 7·26 | |
| Bicetre, .. .. .. | 2,500 | .. | .. | 5·43 | |
| Maison de Retraite, .. .. | 150 | .. | .. | 5·26 | |
| | 15,678 | 19,872 | 105,045 | | |

*General Summary of the Accompts of the Hospitals and Hospices of Paris, for 1820.*

| Receipts. Chapters. | Sums. fr. | c. | Disbursements. Establishments. | Sums. fr. | c. | Number of Paupers relieved by each establishment. | Average expense for each Pauper. fr. | c. |
|---|---|---|---|---|---|---|---|---|
| Fixed and variable revenue of all the Establishments, | 3.903,457 | 9 | Hospitals | 2,773,828 | 45 | 43,650 | 63 | 19 |
| Supplementary grants out of the product of the entrance duties, | 5.164,000 | 0 | Hospices, | 3.062,698 | 9 | 19,032<br>411 | 158<br>.. | 0<br>.. |
| | | | Secoursa domicile, Bureaux de Charite | 1.224.582 | 75 | 86,870 | 14 | 9 |
| Out of the funds of the Department, | 600,000 | 0 | Secoursa domicile, Gen. Admin., and works, | 546.022 | 18 | .... | .. | .. |
| Extraordinary receipts | 126.012 | 21 | Foundling Hospital | 1.282,806 | 98 | 17,349 | 73 | 94 |
| | | | Two Clinical Establishments | 73,206 | 71 | 754 | 97 | 4 |
| Total of the receipts | 9,793.369 | 30 | Vaccination, | 6,955 | 96 | 159 | 43 | 74 |
| Disbursements, | 9,700,282 | 55 | Placing out Children, | 56.893 | 4 | 2.411 | 23 | 60 |
| | | | Direction des Nourrices | 30.000 | 0 | .... | .. | .. |
| Excess of the receipts over the Disbursements, | 93,186 | 75 | Charges foncieres | 295,058 | 46 | .... | .. | .. |
| | | | Extraordinary expenses | 368.229 | 93 | .... | | |
| | | | Total of the Disbursements | 9.700.282 | 55 | 170,636 | | |

The daily expense for each inmate of the Hospices and Hospitals united, is *fr.* 1.1629, which may be divided as follows:

| | | |
|---|---|---|
| Bread, | *fr.* 0 1963 | *fr.* 1.1629 |
| Wines | „ 0. 1215 | |
| Drugs | „ 0 0504 | |
| Direct expenses of the Establishment | „ 0. 7435 | |
| Ditto of the General Administration. | „ 0 0512 | |

Note.—A distinction is made between *Hospital* and *Hospice*, the former being generally applied to Establishments for relief of the sick or maimed, and the latter to those in which are received the aged and infirm, or foundlings.

There are 28 Civil Hospitals, and six *Hospices*, under the superintendence of a "General Council" and an "Administrative Committee appointed by Government." The three Military Hospitals are under the government of the *Etat Major* of the Garrison of Paris. The Hotel Dieu was unquestionably one of those "houses of the Church," which at a remote period were always erected in the vicinity of Cathedrals, for the reception of the poor and sick. The "Hospital de la Charite" was founded by a religious sect, the "Freres de la Charite," all of whom were Surgeons or Apothecaries. All the Hospitals seem to have been founded originally by individuals, or churches. But after the report of the Academy upon the state of the Hotel Dieu in 1786, the construction of four Hospitals was ordained by the King, who by a prospectus, invited the inhabitants of Paris and of France to concur with him by donations and subscriptions in this work of beneficence, and a tax of ten per cent. was imposed on the receipts of all public amusements, except the Opera, for their support.

**Note.**—*Mr. Nicolson, Surgeon of the General Hospital, in reference to the Table cited in the Appendix F, page 147, desires to substitute the following papers marked No.* 92. 92 (A,) 92 (B,) 92 (C.)

## No. 92.

Certifies that the Seamen Paupers stated in the accompanying return for 1834, (marked 93 (A.) were received into the General Hospital without Admission chits, and that tickets were afterwards procured in the usual way from the Medical Board for their admission.

General Hospital,
*9th September*, 1839.

T. CRAWFORD,
*Steward.*

## No. 92. (A.)

*Statement of Seamen and Paupers admitted into the General Hospital by the authority of the Medical Board in the Year*, 1834.

| Year, | | Remained 1st January and admitted during the year. | Total number of days in Hospital. |
|---|---|---|---|
| 1834. | Admitted as Paupers. .. .. | 664 | 23,063 |

The above is a true extract from the General Hospital records

T. CRAWFORD,
*Steward.*

## No. 92. (B.)

*Statement of Paupers admitted into the General Hospital in the year* 1837, *by Tickets of Admission*

| Year, | | Remained 1st January and admitted during the year. | Total number of days in Hospital. |
|---|---|---|---|
| 1837. | Admitted as Paupers from the Police, Secretary to the District Charitable Society, and other authorized authorities during the year, 1837. .. .. | 86 | 1,281 |

The above is a true extract from the Hospital records in my possession.

T. CRAWFORD,
*Steward.*

## No. 92. (c.)

*Statement of Seamen and Paupers admitted into the General Hospital in the year 1837, by the Resident Assistants, as cases of emergency.*

| Year. | | Remained 1st January and admitted during the year. | Total number of days in Hospital. |
|---|---|---|---|
| 1837. | Admitted as Paupers by the Resident Assistants as cases of emergency and immediately reported to the Medical Board for approval. ... .. .. .. | 25 | 477 |

The above is a true extract from the Hospital records in my possession.

T. CRAWFORD,
*Steward.*

## No. 93.

Dear Sir,

There were some errors in my notice of the station of Secunderabad, which I now beg to correct. They were not mine, but derived from the Report of another Surgeon. The ratio of death was to the *strength*, and not to the *sick*, as follows:—

It is sufficient here to state, on the authority of the late Dr. Burke, Inspector General, that the excess of casualties in Her Majesty's regiment at Secunderabad, over that of any Corps in the other stations of the Madras Presidency during four years, "is 117 men—a loss intrinsically of that station, exclusive of officers, women, and children." By another report it appears that:—

| | | |
|---|---|---|
| In 1804 | the proportion of deaths to strength was | 1 in 3.75 |
| " 1805 | " " " " | 1 in 8.22 |
| " 1811 | " " " " | 1 in 5.08 |
| " 1814 | " " " " | 1 in 8.73 |
| " 1815 | " " " " | 1 in 3.26 |
| " 1816 | " " " " | 1 in 6.56 |
| " 1826 | " " " " | 1 in 5.26 |
| " 1827 | " " " " | 1 in 8.96 |
| " 1834 | " " " " | 1 in 8.39 |
| " 1837 | " " " " | 1 in 7.10 |

Average proportion of deaths to strength during 35 years:— 1 in 11.89

The average of deaths during 35 years is stated, in a return by the Madras Medical Board, to be 84·89, making 96·89 according to the corrections, per thousand of strength.

Yours very truly,

J. R. MARTIN,

*Native Hospital, August 9th* 1839.

## No. 94.

My dear Sir,

1st. The correction of the error regarding the mortality at Secunderabad, need only, I think, be made in the report. There might be trouble in correcting the Appendix.

2nd. The evidence on which the new return is made, is a table furnished me by Dr. Macleod, and obtained by him from Madras.

3rd. The former ratios of deaths to sick in Hospital, were made in error, by some medical reporter on the spot.

4th. I have no means of knowing what the true ratio of deaths to patients treated in Hospital may have been at Secunderabad for any year, or years; and this is much to be regretted; but the information now furnished is still very important, as the average furnished by 35 years range of observation, must be one of unusual correctness in a statistical sense; for it is rarely that so wide a range is obtainable, and the value of an average depends on the number of observations. Where the observations are few, it is obvious that the average may be all in excess, or otherwise. The average of 35 years, therefore, may be said to be perfect.

Yours very truly,

*August* 11*th*, 1839. J. R. MARTIN.

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## No. 95.

To F. J. HALLIDAY, ESQ.

*Secretary to the Government of Bengal.*

Sir,

I am directed by the Fever Hospital and Municipal Improvement Committee to transmit to you, for the information of his Honour the Deputy Governour of Bengal, the enclosed copy of the Resolution, to which, under the circumstances therein stated they came to at their Meeting of the 24th instant, and to request that you will lay the same before his Honour, and obtain for the Committee his Honour's instructions for the regulation of their proceedings upon the point in question.

I beg to state that the occurrence of this question delays the completion of their Report, upon which in almost all the other matters it relates to, they have formed, and hope very shortly to lay before his Honour their opinion.

I have the honour to be, Sir,

Your most obedient and humble servant.

Municipal Office,
26*th August*, 1839.

*(Signed)* J. P. GRANT,
*Chairman Fever Hospital and Municipal Committee.*

*Extract from the proceedings of the Committee upon the Fever Hospital and Municipal Improvements on the* 24*th August*, 1839.

I. *Resolved.*—That a reference be made to Government, stating that Mr. Nicolson having questioned the right of the Committee to extend their inquiry to the General Hospital, the same being a Military Institution under the Government of India, the Committee, with reference to the letter of the Right Honourable the Governour of Bengal, under date 22nd November, 1836, solicits the instructions of the Government upon this matter.

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## No. 96.

To THE HONORABLE SIR J. P. GRANT.

*Chairman of the Fever Hospital and Municipal Improvement Committee.*

*Judicial Department*

HONORABLE SIR,

I am directed by the Honorable the Deputy Governor of Bengal to acknowledge the receipt of your letter of the 26th ultimo, giving cover to a copy of a Resolution of the Committee regarding their right of inquiry into the state of the General Hospital.

2nd. In reply, I am directed to state that, as the General Hospital is an Institution under the Supreme Government, in the Military Department, the Deputy Governor of Bengal is unable to authorize the Municipal Committee, in any manner, to inquire into and report upon its concerns or its management.

I have the honor to be,
Honorable Sir,
Your obedient humble servant,
J. H. YOUNG,
*Depy. Secy. to the Govt. of Bengal.*

FORT WILLIAM,
*5th September*, 1839.

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## No. 97.

To THE DEPUTY SECRETARY TO THE GOVERNMENT OF BENGAL.

SIR,

I have had the honour to receive here to-day, your letter of the 5th instant, informing me in reply to mine of the 26th ultimo, that you are directed to state that, "as the General Hospital is an institution under the Supreme Government, in the Military Department," the Deputy Governour of Bengal is unable to authorize the Municipal Committee, in any manner, to inquire into and report upon its concerns or its management."

In submitting to his Honour the difficulty unfortunately suggested, for the first time so late in their proceedings, after the consumption of so much time and labour spent in acquiring all the necessary information regarding the application and extent of the funds appropriated to Medical and Surgical charity in Calcutta, through the medium of the General Hospital, abstaining, with the utmost care, from any inquiry into its concerns or management as a Military Establishment, it was thought by the Committee sufficient merely to state what the difficulty was, which was suggested.

But as it will be my duty to submit to the Committee the necessity of submitting to his Lordship, the Right Honourable the Governour General, with whom this inquiry originated, the difficulty, in point of form, which prevents the Committee from complying with his Lordship's desire, expressed in Mr. Mangles' letter to the Committee, under date 22nd November, 1836, by direction of the Right Honourable the Governour of Bengal, stating that the report then made to his Lordship by the Committee was in his Lordship's opinion deficient, "in as much as it did not enter into an examination and review of the funds already appropriated to charities of this description—(namely of the description of an Hospital for the relief of the sick poor) of the manner in which they were applied—of the modes which might be suggested for their increase or improved application—and of the relative value of existing Institutions ;" a compliance with which desire on the part of the

Committee, was declared by his Lordship, in that letter, to be a preliminary condition to his admitting the propriety of such a grant of money as had been requested for the establishment of a Fever Hospital—and the General Hospital being one of the most important of the six Institutions, having the distribution of funds appropriated to charities of a Medical or Surgical description in Calcutta, I think, before doing so, it is proper to state for his Honour's information, that the Committee were led into what his Honour considers an errour by the conduct of Mr. Nicolson, the Surgeon in charge of the Hospital, and by his statement relative to the command it is under.

To the Queries put to him, which I drew as Chairman of the Committee, I prefixed a distinct notice that the inquiry made, proceeded by *desire of the Governour General in his capacity of Governour of Bengal,* to enable the Committee to report as required upon the *General Hospital*—and to this requisition, so proceeding, Mr. Nicolson, without suggesting the existence of any objection, rendered the complete and candid compliance, which supposing that there was no substantial or formal objection, was to be expected from his character.

One of the questions put to Mr. Nicolson was the following:—

"*Query 4. The Hospital is understood to be primarily attached to the Garrison of Fort William; does it receive other persons not Military, &c. &c.?*"

The answer was this:—

"*The Hospital and Surgeons, both permanent and temporary, doing duty at the Hospital, are considered attached to Fort William, and under the orders of the Governour,*" whom I understood, and I believe the Committee understood, to be the *Governour of Bengal,* as having, within the Fort of Fort William, and over all the Military Officers and Departments attached thereto, a separate and distinct command, apart from the Commander-in-Chief, to whose orders the army generally, over the whole of India, is subject.

I therefore, and the Committee along with me, unanimously, as I believe, with the exception of Mr. Nicolson, when we had arrived at the end of our inquiry, having it in evidence that the General Hospital to the extent of from two-thirds to three-fourths is an Hospital for Non-Military patients, and to the extent of more than one-half of these, an Institution for the charitable relief of the sick poor, and that its officers were under the orders of the Governour of Fort William, whom we supposed to be the Governour of Bengal, conceived ourselves not only warranted, but in the performance of our undertaking, bound to inquire into and report upon the application of its funds, and the nature and value of the Institution, so far as it performed the functions of a Medical and Surgical Charity, under the commands issued to us by the Governour of Bengal.

I hope the Committee as misled by me, and I myself as being little acquainted with matters of Military detail, may stand excused with his Honour for having committed what we now find to have been an errour, and for the delay this unfortunate occurrence has occasioned, and may still occasion, in the presenting to his Honour our Report.

I have the honour to be, Sir,
Your most obedient and humble servant,
(*Signed*) J. P. GRANT,
*Chairman Fever Hospital and Municipal Committee.*

TITAGHUR,
*8th September,* 1839.

# No. 98.

To J. P. GRANT, ESQ.
*Officiating Secretary to the Government of India.*

SIR,

The Committee appointed by the Right Honourable the Governour General of India, in his capacity of Governour of Bengal, for the establishment of a Fever Hospital in Calcutta, and for framing a plan of local management and taxation in the said town, had the honour to receive from R. D. Mangles, Esq. then Secretary to the Government of Bengal, a letter under date 22nd November, 1836, informing the Committee that he was directed by the Right Honourable the Governour of Bengal, in reply to a letter from the Chairman of the Committee, applying for a grant of money for the purpose of assisting in the opening with the advantages and upon the scale, which they suggested after having maturely weighed the subject, a Fever Hospital in some degree commensurate with the general exigencies of the Native community, that his Lordship would wait for a further report upon the other objects which had been submitted to the Committee, before he could admit the propriety of such a grant of money as had been requested; for that it appeared to him, that the information before him was far from being so complete, as to justify him in coming to a decision upon it, that the Report seemed to his Lordship to be deficient, in as much as it did not enter into an examination and review of the funds already appropriated to Charities of this description, of the manner in which they are applied, of the modes which may be suggested for their increase and improved application, and of the relative value of existing Institutions; nor was it so particular as might be wished upon the new Establishment it proposed to found.

The Committee applied itself with due diligence to render their Report as complete as was in their power, under what they considered the ample authority committed to them by his Lordship.

Having completed their investigation of the various matters connected with the sanitary improvement of the City, they proceeded to examine into the details necessary to ascertain the nature, and immediately necessary extent, of the Hospital and additional Dispensaries, which they proposed to found, and they had completed their Report so as to afford to his Lordship all the information upon these subjects which his Lordship desired.

But, in order to comply with what his Lordship had declared to be a necessary condition of the grant of money necessary to carry the design of opening a new Hospital into execution, they then proceeded to enter into an examination and review of the funds already appropriated to Medical Charities, the manner of their application, their susceptibility of increase and improvement, and the relative value of such existing Institutions in Calcutta.

Of these the most material next to the Native Hospital, if not equal to it in importance, appeared to them to be the Presidency General Hospital, and the Committee accordingly applied to the Surgeon of the General Hospital, a member of their Committee, for the necessary information regarding that establishment.

To the queries which they put to him in writing, they prefixed, as to those they sent to other Publick Officers to whom they applied for the like information in other Departments, the following preamble;—

" Queries by the Committee on the Fever Hospital and Municipal Improvements, to " which answers are requested from S. Nicolson, Esq. Surgeon to the General Hospital."

"The Governour General, in his capacity of Governour of Bengal, has intimated "to the Committee his desire, that in the Report they are to make upon various subjects "referred to them, they should 'enter into an examination and review of the funds "already appropriated to Charities of a Medical description, of the manner in which they are "applied, of the modes which may be suggested for their increase or improved application, "and of the relative value of the existing Institutions.' In order to enable them to report "as required upon the *General Hospital*, forming one of the most material of these Insti-"tutions, they request from Dr. Nicolson answers to the following queries:"—Although the learned Surgeon being a Member of the Committee, could not require any information of the nature and description of the authority under which they instituted their inquiries.

To their inquiry, they received from this learned person the full and satisfactory answers, which might be expected from his character, without any intimation on his part, that the Committee were exceeding the limits of their authority, in instituting an investigation into the concerns of his Hospital—and he informed them, that "the Hospital and Surgeons doing duty at the Hospital, are considered attached to Fort William, and under the orders of the Governour." The members of the Committee generally had always understood the Governour of Bengal to be the Governour of Fort William—but in this, being a Military question, they might very easily be mistaken. The learned member also informed them, that "the Hospital was open for the reception of Seamen belonging to H. M's. or the Company's service, or to private and foreign ships, and also to European Townsmen and Paupers—nor indeed were Europeans or Americans in any other class of life refused admittance;"—and from the account furnished them by the learned member it appeared, that this Hospital, although a Military establishment in its government, and to the extent required by the Garrison, also in the relief it afforded, had been in this latter respect three times as much a Civil as a Military Institution, and that in so far as it administered Medical and Surgical relief to Non-Military patients, it was to the extent of half of that relief an Institution administering, through the charity of the Government, to the Medical necessities of the poor.

The Committee, therefore, could not but consider it as an Institution largely administering funds appropriated to Charities of a Medical description. Having as Chairman of the Committee framed by their desire a Draft of their Report, in which I had embodied the information obtained regarding the Presidency General Hospital, together with such observations thereon, as I deemed necessary, I submitted this Draft Report for the correction or approval of the Committee. The Committee had proceeded through the greater part of it. But, when they came to that part which related to the General Hospital, the learned member, the Surgeon of that Institution, having stated that he differed from some of the opinions, which I had in the Draft of the Report submitted to the Committee regarding the General Hospital, but which had not yet been considered by the Committee, suddenly objected to our proceeding at all with that part of the Report, as embracing an inquiry which was beyond our authority; that authority being derived from the *Governour of Bengal;* whereas the Presidency General Hospital is a Military Institution, under the authority of the *Governour General,* or *Vice-President in Council.*

The Committee thought it necessary to state to the Honourable the Deputy Governour of Bengal, the difficulty which had occurred, unfortunately after much time had been spent, and all the information attainable acquired upon the history, character, conduct, and usefulness, of this Institution, and to desire his commands to guide them in their further proceedings.

In answer to my letter transmitting the Resolution of the Committee to this effect, I had the honour to receive a letter from the Deputy Secretary to the Government

of Bengal, informing me that, as the General Hospital is an institution under the Supreme Government, in the Military Department, the Deputy Governour of Bengal is unable to authorize the Municipal Committee in any manner to inquire into and report upon its concerns or its management.

In these circumstances the Committee have completed their Report, so far as they have been able to do so, leaving out all notice of this important Charity, except as concerns the Medical results obtained from the learned Surgeon's Returns, in the same way as they might notice those of an Hospital in London or in Paris. They are however sensible, that, without a Report upon this Hospital, in so far as it administers Medical and Surgical relief to Non-Military patients, and to paupers sojourning or residing in Calcutta, they cannot fulfil the desire communicated to them by the Right Honourable the Governour General, in his capacity of Governour of Bengal, and they therefore humbly solicit from the Honourable the Vice-President in Council, his Honour's commands, that they may inquire into and report upon the funds appropriated to Medical and Surgical Charities, through the means of the Presidency General Hospital—into the manner in which these funds are applied—into the modes which may be suggested for their increase or improved application—and into the relative value of this great charitable Institution to the Medical and Surgical necessities of the sojourners, or inhabitants in Calcutta, of those races and classes which are admissible into it.

I have the honour to be, Sir,<br>
Your most obedient and humble servant,<br>
(*Signed*) J. P. GRANT,<br>
*Chairman Fever Hospital and Municipal Committee.*

TITAGHUR,<br>
*21st September* 1839.

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## No. 99.

To THE HONOURABLE SIR J. P. GRANT,<br>
*Chairman of the Fever Hospital and Municipal Committee.*

No. 505.<br>
*Military Department.*

HONOURABLE SIR,

Your letter of the 21st instant, to the address of the Officiating Secretary to the Government of India, in the Judicial Department, having been transferred to this Department, I am directed to inform you in reply, that the General Hospital being a Military, and not a Charitable Institution, although Paupers are under certain restrictions admitted, the Honourable the President in Council does not think it would be either regular or proper to grant the Committee, of which you are Chairman, the authority solicited for the purpose of making the inquiries proposed.

I have the honour to be,<br>
Honourable Sir,<br>
Your most obedient servant,<br>
(*Signed*) W. CUBETT, *Major*,<br>
*Offg. Secy. to the Govt. of India*

COUNCIL CHAMBER,<br>
*30th September*, 1839.

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# No. 100.

## MINUTE OF THE GOVERNOUR GENERAL ON THE IMPROVEMENT OF CALCUTTA.

The increasing extent and population of Calcutta, the Capital of the British Empire in India, and the seat of the Supreme authority, require the serious attention of Government. It is now become absolutely necessary to provide permanent means of promoting the health, the comfort, and the convenience of the numerous inhabitants of this great Town.

The construction of the Publick Drains and Water-Courses of the Town is extremely defective. The Drains and Water-Courses in their present state neither answer the purpose of cleansing the Town, nor of discharging the annual inundations occasioned by the rise of the River, or by the excessive fall of rain during the South-West Monsoon. During the last week a great part of this Town has remained under Water, and the Drains have been so offensive, that unless early measures be adopted for the purpose of improving their construction, the health of the inhabitants of Calcutta, both European and Native, must be seriously affected.

The defects of the climate of Calcutta during the latter part of the rainy season may indeed be ascribed in a great measure to the state of the Drains and Water-Courses, and to the stagnate water remaining in the Town and its vicinity.

The health of the Town would certainly be considerably improved by an improvement of the mode of draining and cleansing the Streets, Roads, and Esplanade. An opinion is generally entertained that an original errour has been committed in draining the Town towards the River Hooghly. And it is believed that the level of the country inclines towards the Salt-Water Lake, and consequently that the principal channels of the Publick Drains and Water-Courses ought to be conducted in that direction.

Experience has manifested that during the rainy season, when the River has attained its utmost height, the present drains become useless; at that season the rain continues to stagnate for many weeks in every part of the Town, and the result necessarily endangers the lives of all Europeans residing in the Town, and greatly affects our Native subjects.

Other points connected with the preservation of the health of the inhabitants of this Capital, appear also to require immediate notice. No general regulations at present exist with respect to the situation of the Publick Markets, or of the places appropriated to the slaughter of Cattle, the exposure of Meat, or the burial of the Dead. Places destined to these purposes must necessarily increase in number with the increasing population of Calcutta. They must be nuisances wherever they may be situated, and it becomes an important branch of the Police to confine all such nuisances to the situations wherein they may prove least injurious, and least offensive. It must however have been generally remarked, that places of burial have been established in situations wherein they must prove both injurious and offensive; and Bazars, Slaughter-Houses, and Markets of Meat now exist in the most frequented parts of the Town.

In those quarters of the Town occupied principally by the Native inhabitants the houses have been built without order or regularity, and the streets and lanes have been formed without attention to the health, convenience, or safety of the inhabitants. The frequency of Fires (by which many valuable lives have been annually lost, and property to a great extent has been destroyed) must be chiefly ascribed to this cause.

It is a primary duty of Government to provide for the health, safety, and convenience of the inhabitants of this great Town, by establishing a comprehensive system for the improvement of the Roads, Streets, Publick Drains, and Water-Courses, and by fixing

permanent rules for the construction and distribution of the Houses and Publick Edifices, and for the regulation of nuisances of every description.

The appearance and beauty of the Town are inseparably connected with the health, safety, and convenience of the inhabitants; and every improvement which shall introduce a greater degree of order, symmetry, and magnificence in the Streets, Roads, Ghats, and Wharfs, Publick Edifices and Private Habitations, will tend to ameliorate the climate, and to promote and secure every object of a just and salutary system of police. These observations are entirely compatible with a due sense of the activity, diligence, and ability of the present Magistrates of Calcutta, by whose exertions considerable improvements have been made in the general Police of the Town. The Governour General in Council has frequently expressed his approbation of the conduct and services of the present Magistrates of Calcutta, who have zealously and judiciously employed every effort, within their power, to mitigate the effects of the evils described in this Minute. But the Magistrates of Calcutta must be sensible that the establishment of a more comprehensive system of permanent regulation, is indispensably necessary for the purpose of securing to the Town the full benefit of the laudable services of the Officers to whom the administration of the Police has been entrusted by Government

With these views, the Governour General proposes that the undermentioned gentlemen be appointed a Committee to consider and report to His Excellency in Council the means of improving the Town of Calcutta;—

Major General Fraser,
Major General Cameron,
Mr. Speke,
Mr. Graham,
Mr. Brooke,
Mr. Taylor,
Mr. R. C. Birch,
Colonel Pringle,
Mr. S. Davis,
Mr. G. Dowdeswell, Superintendent of Police,
Lieutenant Colonel Harcourt,
Captain Shawe,
Colonel Garstin,
Mr. Tucker,
Mr. Farlie,
Mr. Colvin,
Mr. Ross,
Mr. Alexander,
Major Colebrooke
Captain Wyatt,
Mr. Dashwood,
Captain Anbury,
Captain Preston,
Captain Blunt, of Engineers,
Captain Sydenham,
Messrs. C. F. Martin,
W. C. Blaquiere,
E. Thoroton,
and
A. Macklew, Justices of the Peace for the Town of Calcutta,
and
Mr. R. Blechynden,

The Governour General proposes that Mr. Tiretta be directed to attend the Committee, and that Captain Blunt, of Engineers, be appointed to officiate as their Secretary.

The Governour General further proposes that the following special instructions be issued to the Committee:—

1st. To take the level of the Town of Calcutta and the adjacent country, and ascertain and report what alteration may be necessary in the direction of the Publick Drains and Water-Courses.

2ndly. To examine the relative level of the River during the rainy season compared with the level of the Drains and Water-Courses.

3rdly. To suggest what description of Drains or Water-Courses may be best calculated, 1st, to prevent the stagnation of rain water in Calcutta and the vicinity thereof, and, 2ndly, to cleanse the Town.

4thly. To consider and report what establishment may be necessary for Cleansing the Drains and Water-Courses, and for keeping them in constant repair.

5thly. To take into consideration the present state of all places of interment in the vicinity of Calcutta, and to propose an arrangement for the future regulation of those places, in such manner as shall appear to be best calculated for the preservation of the health of the inhabitants of Calcutta and its vicinity.

6thly. To examine the present state and condition of the Bazars and Markets for Meat, and of the Slaughter-Houses in Calcutta, and to propose such rules and orders as shall appear to the Committee to be proper for the regulation of those already established—for the removal of such as may have actually become nuisances—and for the establishment of New Markets or Slaughter-Houses hereafter.

7thly. To inquire into all existing nuisances in the Town and vicinity of Calcutta, and to propose the means of removing them.

8thly. To examine and report for the consideration of Government, the situations best calculated for opening new Streets and Roads, leading from East to West from the new Circular Road to Chowringhee and to the River, and from North to South, in a direction nearly parallel with the New Road.

9thly. To suggest such other plans and regulations as shall appear to the Committee to be calculated to promote the health, convenience, and comfort, of the inhabitants of Calcutta, and to improve the appearance of the Town and its vicinity.

10thly. To form and submit to the Governour General in Council an estimate of the expense required to complete all such improvements, as may be proposed by the Committee

The means of raising the necessary funds for the purpose of defraying the expense which must attend the execution of the important improvements suggested in this Minute, will claim the early and deliberate consideration of Government. The Governour General in Council entertains no doubt, that those funds may be raised without subjecting the Honourable Company to any considerable expense, and without imposing a heavy tax on the inhabitants of Calcutta;—it will certainly be the duty of Government to contribute in a just proportion to any expense which may be requisite for the purpose of completing the improvements of the Town.

(*Signed*) WELLESLEY

FORT WILLIAM,
*June 16th*, 1803

# No. 101.

To

Major-General Fraser,
Major-General Cameron.
Peter Speke, Esq.
Thomas Graham. Esq.
W. A. Brooke. Esq.
John Taylor, Esq.
R. C. Birch, Esq.
Colonel Pringle,
Samuel Davis, Esq.
George Dowdeswell, Esq.
Lieutenant-Colonel Harcourt.
Captain Shawe.
Lieutenant-Colonel Garstin
Thomas Dashwood, Esq.
Henry St. George Tucker. Esq
Wm. Fairlie. Esq.
Alex. Colvin, Esq.
David Ross, Esq
James Alexander, Esq.
Major R. Colebrooke,
Captain Wyatt,
Captain Anbury.
Captain Preston,
Captain Blunt,
Captain Sydenham.
C. F. Martin, Esq.
W. C. Blaquiere, Esq.
E. Thoroton, Esq.
A. Macklew. Esq.
and
R Blechynden. Esq.

GENTLEMEN,

In obedience to the commands of His Excellency the Most Noble the Governour General in Council, I have the honour to acquaint you that His Excellency in Council has been pleased to appoint you a Committee to consider and report the means of improving the Town of Calcutta.

The objects to which your attention is to be more immediately directed, will be notified to you forthwith, as well as the place at which your Meetings are to be held.

Captain James Blunt, of Engineers, is ordered to officiate as your Secretary, and Mr. Tiretta is directed to attend you

I have the honour, &c.

*(Signed)* J. LUMSDEN,

*Chief Secy. to the Government.*

COUNCIL CHAMBER, FORT WILLIAM,
*16th June*, 1803

## No. 102.

The Governour General in Council is pleased to appoint the following gentlemen to be a Committee to consider and report the means of improving the Town of Calcutta:—

Major-General Cameron.
P. Speke, Esq.
T. Graham, Esq.
J. Taylor, Esq.
R. C. Birch, Esq.
S. Davis, Esq.
G. Dowdeswell, Esq.
Captain James Armstrong,
Major Shawe,
Lieutenant-Colonel Garstin,
Thomas Dashwood, Esq.
Henry St George Tucker, Esq
W. Fairlie, Esq.
A. Colvin, Esq.
James Alexander, Esq.
Lieutenant-Colonel Colebrooke,
Captain Thomas Anbury,
Lieutenant B. Sydenham,
C. F. Martyn, Esq.
W. C. Blaquiere, Esq.
E. Thoroton, Esq.
Alexander Russell, Esq.
John Shoolbred, Esq.
The Reverend Mr. Brown.
The Reverend Mr. Buchanan.
Lieutenant-Colonel Mercer,
R. P. Smith, Esq.
H. T. Colebrooke, Esq.
Colonel Green,
M. G. Prendergast, Esq.
and
R. Blechynden, Esq.

Ordered, that the Committee be informed that the general objects to which their attention is to be directed *will be notified to them forthwith*, as well as the place where their Meetings are to be held, and that His Excellency in Council in the meantime desires they will immediately obtain such information as can be procured with respect to the causes of the late destructive fires in Calcutta, and suggest, for the consideration and orders of Government, such measures as shall appear to them to be best calculated to guard the Town from the recurrence of this calamity at any future period.

Ordered that the Committee be also informed that Mr. Prendergast is appointed to officiate as their Secretary.

CRIMINAL,
*2nd June*, 1804

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## No. 103.

To JOHN LUMSDEN, ESQ.
*Chief Secretary to Government, &c. &c. &c.*

SIR,

By desire of the Committee for improving the Town of Calcutta, I have the honour to transmit a letter and two inclosures addressed to His Excellency the Most Noble the Governour General in Council, I have also the honour to transmit a plan which is referred to in the accompanying letter, all of which I request you to take an early opportunity of submitting for his Excellency's consideration.

I have, &c.

CALCUTTA,
*4th July*, 1804.

*(Signed)* M. G. PRENDERGAST,
*Secretary to the Committee for Improving Calcutta.*

# No. 103. (A.)

To HIS EXCELLENCY THE MOST NOBLE RICHARD. MARQUIS WELLESLEY, K. P.

*Governour General in Council, &c &c. &c.*

MY LORD,

We have had the honour to receive a letter from the Chief Secretary to the Government, dated the 2d instant, acquainting us that your Excellency in Council had been pleased to constitute us to be a Committee to consider and report to Government the means best calculated for improving the town of Calcutta, and particularly for preventing the recurrence of accidents by fire.—To effect the intentions of your Excellency, we judged it to be advisable to select special Committees, to consider, in the first instance, the different objects of improvement, under the following designations, viz.

"A special Committee for surveying those quarters of the Town which have been "recently burnt down, and preparing a plan for re-building the Houses in a manner more "consistent with the safety, convenience, and health of the inhabitants."

"A special Committee for the purpose of considering the most eligible situations for "opening new roads, with a view to facilitate the communication between the various parts "of the Town of Calcutta, and to promote the general intercourse and convenience of the "inhabitants."

"A special Committee to consider the most effectual means of draining the Town of "Calcutta."

"A special Committee for considering the nuisances which exist throughout the Town, "and proposing the best means of removing them."

"A special Committee to consider and report upon such improvements in the vicinity of the Town, as may tend to contribute to the convenience of the inhabitants of the "Town, and neighbourhood of Calcutta."

"A special Committee for the purpose of considering the easiest and most effectual "means of raising the funds necessary for carrying the intended improvements into effect."

Your Excellency in Council having expressed a desire to be furnished with an early report upon the causes of the late destructive fires in Calcutta, and upon the means which should be adopted to prevent the recurrence of casualties of that nature, we directed our immediate attention to those important subjects.

Those questions having likewise been considered in detail by the special Committee for surveying the quarters of the Town which have been recently burnt down, we have the honour to transmit to your Excellency in Council, a copy of twc reports furnished by those gentlemen.

On the fullest consideration of the circumstances stated by the special Committee, and on the maturest reflection the general question which the time would admit, we beg leave to offer it as our opinion that the late fires are chiefly ascribable to the combustible nature of the material of which the houses of the natives are, for the most part, constructed, and to the singular and objectionable manner in which those buildings are crowded together. Those circumstances might probably appear sufficient to account for the frequency of fires during the dry and windy season; however, we are not without apprehensions that the fires have not been uniformly accidental, it having been stated to us, in the course of our inquiry, that one person had actually been convicted as an incendiary before the Court of Circuit, and that another has been committed to take his trial for the same offence.

It does not appear to us to be necessary to trouble your Excellency in Council with any suggestions respecting the last mentioned point, as we understand that the Magistrates have already offered rewards for the apprehension of offenders of that description, who if convicted will of course suffer the punishment prescribed by Law for those crimes. We shall accordingly proceed to state to your Excellency such suggestions as appear to us to be best calculated to improve the construction of the several quarters of the Town which have been lately burnt, and to prevent the destructive effects of fire in those places in future.

With this view we beg leave to submit the following suggestions to the consideration of your Excellency in Council.

First. That the Houses be constructed in straight lines, or as nearly straight as may be practicable, leading from East to West, with streets or passages running in the same direction, so as to admit only a double range of houses between each of the passages, running North and South, at the distance of 150 or 200 feet from each other.

That tanks or wells, as shall appear most convenient on local examination, be dug in the different wards of the Town.

That a Fire Engine be established in the principal wards, or at such other places as shall appear to be most convenient for affording assistance in cases of fire.

By the adoption of those measures we are induced to believe, that although fires might still happen, their effects would by no means be so destructive, as at present, to the property of the Natives.

We are likewise satisfied that the primary object of securing the persons of the inhabitants from injury during casualties of the above nature, would be completely attained by those means, and that the Town in general would become more healthy.

In consequence of the present singular and ill-judged construction of most of the houses and buildings of the Natives, they are extremely difficult of access at any time, and on the occasion of fires the narrow passages become destroyed either by the fall of some of the buildings, or by the populace themselves, so that individuals frequently find it impracticable to escape from the flames.

The question above stated of digging tanks and wells at convenient places in or near the different wards, is obviously calculated to facilitate and expedite the extinction of the flames, particularly when aided by the Fire Engine, which we have also proposed should be established at convenient places. The earth which may be excavated from the tanks would likewise be of essential use in filling up the inequalities of the ground. The Natives would also by these means, be furnished with pure and wholesome water.

The quarters of the Town lying to the Southward of Durrumtollah having suffered more than others from the effects of the late fires, we do ourselves the honour of transmitting to your Excellency in Council, a plan of that part of the City. The houses there have in a great measure been destroyed, which circumstance induces us to recommend that the projected improvements be, in the first instance, carried into effect in that quarter.

We are more fully persuaded of the necessity of commencing the improvements there, when we consider the frequency of fires which have occurred in that part of the Town, and the danger to which the other parts of Calcutta must be exposed by their relative situation to a place so subject to conflagrations.

We take the liberty to suggest that the proper Officers be directed to take necessary measures, as soon as circumstances will admit, for purchasing, on account of Government, the ground requisite for opening the streets or passages through the different wards in that quarter of the Town, to which these remarks allude (in such cases, as it shall appear

to be necessary, to make purchases on that account) and likewise for obtaining the ground required for the tanks and wells proposed to be dug.

A deputation from this Committee will afford the Revenue Officers such assistance as the latter may require in the adjustment of those points.

In the progress of our inquiry, it has been suggested to us that it would be expedient to encourage the erection of houses with tiled instead of straw roofs, by a remission on the former, of the tax on the houses, or of the ground rent, or of both. We were sensible of the advantages which tiled roofs possess over straw choppers, and should be happy to suggest any means calculated to promote the most general use of the former, consistent with the pecuniary circumstances of the lower order of the Natives.

We do not, however, conceive that the end proposed could in any degree be attained by the remission of the Land Tax, or the Assessment on Houses. On a reference to the Collector of Calcutta, it appears that the aggregate amount of the Tax on the ground occupied by all the tiled and straw houses throughout Calcutta is only Sicca Rupees 7,346 : 13 : 4 per annum.

From the information likewise communicated to us by the Magistrates, it appears that the rate of assessment on straw houses is so extremely low (not exceeding in some cases two annas per quarter) that the remission of it could not operate as any encouragement to the Natives to build or occupy houses with tiled instead of thatched roofs, the expense of the former being double that of the latter, as may be seen more particularly on a reference to the inclosed report of the special Committee.

If the plan, which we have had the honour to suggest should promise, on being reduced in some measure to practice, to have the desired effect, we would beg leave to recommend that it be extended gradually throughout the Town of Calcutta.

Immediately connected with the improvements above mentioned, is a measure which appears to be highly desirable, and to which our attention has been directed by command of your Excellency in Council. We mean that of opening new streets with a view of facilitating the communication between the different parts of the Town—of affording a more free circulation of air in the populous quarters—and, finally, of improving the draining of Calcutta.

In the plan of that part of the Town, which we have now the honour to lay before your Excellency in Council, we have accordingly traced out such roads as we think should be made from Chowringhee to the new Circular Road, and again from the Burying Ground Road to the Durrumtollah.

We are aware that those roads cannot be made without a considerable expense to Government, and that this expense would be greatly enhanced in the more populous and wealthy parts of the Town; on the other hand, it is to be observed, that if it should at any future period be deemed advisable to carry the projected improvement into effect, either generally throughout Calcutta, or in that part of the City to which these remarks more particularly allude, it is to be inferred from the increasing wealth and population of Calcutta, that a still heavier expense would then be required, than would accomplish the object at present. On a consideration therefore of all the circumstances of the case, we beg leave to recommend that the ground required for the Roads above specified be purchased on account of Government, and that the roads be opened as soon as the necessary compensations shall have been paid to the proprietors of the ground and buildings. This step appears to us to be the more requisite, as the site and arrangements of the wards of the Town, on the principle above stated, will depend in a great measure upon the decision of your Excellency in Council with respect to the roads in question. At the same time we are of opinion that the construction of the drains and laying the roads with brick might be postponed until funds applicable to the projected improvement shall have been provided,

and those funds shall not be required for objects of more immediate urgency. We have the less hesitation in offering the latter suggestion, as solely by opening those roads there will always be a passage for Fire Engines to the different wards in that quarter, and this measure will considerably facilitate the other arrangements which we have proposed for extinguishing fires. In addition to that consideration, the actual experience which we shall acquire respecting the expense and difficulties which may attend the execution of this work, will enable us to form a more perfect judgment how far that plan of improvement can be extended generally throughout Calcutta. Should no particular obstacles occur, we shall hereafter have the honour to state to your Excellency in Council our sentiments respecting such other Roads, as it may appear to us advisable to open in the Central and Northern parts of the Town.

We have, &c.

*(Signed)* W. N. CAMERON
C. GREEN,
H. COLEBROOKE.
G. DOWDESWELL,
R. H. COLEBROOKE,
THOS. ANBURY,
THOS. PRESTON,
A. RUSSELL,
C. F MARTYN.
E. THOROTON,
W. C. BLAQUIERE
R BLECHYNDEN,
M G. PRENDERGAST

# No. 103. (B.)

*At a Meeting of the Special Committee for the purpose of Surveying the Bazars, &c. at Major General Cameron's Quarters in Fort William, 11th June, 1804.*

*Present.*

Major-General Cameron.

*Members.*

Reverend Mr. Brown,
Captain Anbury,
W. C. Blaquiere,
J. J. B. Proby,
R. Blechynden.

*Attending.*

Captain Johnstone,
Ensign Macleod.

Having examined that part of the Town where the late fires have happened, the Committee has been led to make the following observations :—

Besides the predisposing causes in the climate towards effecting the easy combustion of such materials as those with which the generality of the Native habitations in and about Calcutta are composed, a variety of other causes combine to occasion the dreadful and destructive conflagrations that have of late occurred,—the contiguity and junction of the houses, the careless and ill managed use of fire amongst the lower class of Natives, both in cooking and their favourite habit of smoking, are perhaps the principal; to which may be added their apathy, disinclination from prejudice, and a superstitious adherence to the doctrine of destiny, which prevents their making any exertion, or indeed any attempt, to arrest the fire in its progress; and it has not unfrequently been observed that when, with the least attempt, a fire might have been subdued by pulling down a few of the adjacent huts, they would rather allow it to continue its consuming course, than assist even in removing a single contiguous chopper, though it would have preserved that under which they and their whole family were sheltered. Another cause of the very extensive range which these fires have embraced, is the flakes and large portions of lighted straw or grass which are carried to distant parts by the high winds, which invariably prevail at that season when fires are most frequent, and where, most probably, fire would not have occurred but from this cause.

But it does not appear to be doubted that many of the late fires have proceeded from incendiaries; whether to gratify private malice, with a view to plunder, or to cause an increased demand, and consequently an enhanced price, for straw, grass, bamboo, mats, and other building materials in the Bazar, is not perhaps exactly ascertained, certain it is that people have been, by the vigilance of the Police, apprehended on suspicion, if not actually detected in the very fact. It is also known that one, if not more, of the recent fires, commenced in huts where fire had not been in use for many days previous; in such a case a very fair presumption lies that it must have originated from a wilful cause. From all these circumstances it must appear clearly, that where straw huts exist, fire must frequently happen.

It becomes then a consideration of much importance and some difficulty, to decide on and adopt such means as are the most likely to defeat the attempts of wilful and malevolent incendiaries, and to prevent, if possible, fires from accidental causes. To this end, in the first instance, an alteration in the materials of which the huts in most parts of the Town are constructed, seems to be the most likely mode of effecting it. It should therefore be recommended to those who have their habitations to rebuild; for it is a regulation that appears not easy, if at all possible, to be enforced as a law throughout the Town, and that

the experiment can only be tried on such places where recent fires have destroyed the huts originally erected. To those Natives then, who are about to re-establish their habitations, it should be suggested to build their houses as follows,

| | | |
|---|---|---|
| Walls of mats plastered with mud, | | Mud walls, |
| Ditto of Gram stick, | ditto, | Cutcha brick walls, |
| Ditto of Bamboos split, | ditto, | or |
| Ditto Wattled, | ditto, | Cutcha pucka walls, |

and all roofed with tiles;—at the same time such inducements may be held out to them to acquiesce, as may seem the most likely to have the desired effect. Two causes may probably operate to render every recommendation of no avail, namely the difference of expense, and the loss of comfort; for it is certainly obvious that a straw hut is much cooler than one tiled. To the first may be opposed, that by frequent fires the rebuilding of straw huts will cost in the end considerably more than one originally built of less combustible articles. (Vide estimates No. 1 to 5,) to the second it may be observed, that by putting mats under the tiles, the effects of heat are obviated.

However hard it may be considered to bear upon the Natives, to oblige them to build in a particular mode, it would be a regulation infinitely to their own benefit and comfort, as well as the preservation of their lives and property; for it has been proved by existing instances, that houses, constructed of the materials before mentioned, have completely resisted the flames without any appearance of injury. Thus far the Natives may be considered as concerned in the means most likely to prevent a recurrence of the dreadful calamity of fire in the Native parts of the Town.

If, under all circumstances, it is thought oppressive on the lower classes of the Natives, to oblige them to alter their mode of building, and consequently, that straw huts and choppers are still to be tolerated, it remains with Government or the Police to carry into effect such regulations in the rebuilding the houses, lately destroyed, as may be deemed in some degree useful towards the prevention of fire in future, and improvement of that quarter of the Town. It may be therefore advisable, and certainly a most favourable opportunity now exists, to recommend the opening of two or three principal streets, and intersecting them, as nearly as possible, at right angles, by others of a breadth not less than will easily admit of the largest sized Fire Engine and the people necessary to work it, with room to turn and move it in all directions.

These streets will form divisions or cantons, easily superintended by a Jemedar or such other

No. 1. Estimate of the probable expense for making a hut thatched with Wooloo-straw, measuring 15 feet long and 7½ feet broad in the inside,—the walls of Durmah mats.

| | Sa. Rs. | A. | P. |
|---|---|---|---|
| 2 Choppers, .. .. .. | 2 | 0 | 0 |
| 15 Bamboos, .. .. .. | 2 | 4 | 0 |
| 10 Seers Jute twine, .. .. | 0 | 10 | 0 |
| 50 Durmah mats, .. .. | 1 | 8 | 0 |
| 2 Khahuns Wooloo-straw, .. | 3 | 0 | 0 |
| 10 Days Ghurramies, .. .. | 1 | 5 | 3 |
| 2 Ditto Coolies, .. .. | 0 | 3 | 2 |
| Total, Sa. Rs. .. .. | 10 | 14 | 5 |

No. 2. Estimate of the probable expense for making a hut, roofed with Tiles, (*Khuprail*) measuring 15 feet long and 7½ feet broad in the inside, —the walls Gurran Tiles plastered with mud.

| | Sa. Rs. | A. | P. |
|---|---|---|---|
| 30 Bamboos at 15 Rs. per 100, | 4 | 8 | 0 |
| 25 Seers Jute twine, at Rs. 2 : 8 per md. .. .. .. | 1 | 9 | 0 |
| 4200 Tiles, thatching Rs. 1 : 4 per 100 .. .. .. | 5 | 0 | 5 |
| 20 Edges, .. .. .. | 0 | 4 | 0 |
| 360 Gurran sticks, .. .. | 3 | 0 | 0 |
| 25 Days Gurramies at 4 Rs. per month, .. .. .. | 3 | 5 | 4 |
| 8 Ditto Coolies at 3 Rs. ℔ mon. | 0 | 12 | 9 |
| 1 Ditto Bricklayer, .. .. | 0 | 2 | 6 |
| 1 Md. soorkey, ½ md. chunam, | 0 | 5 | 0 |
| Durmah mats laid under the tiles, | 1 | 12 | 0 |
| Total, Sa. Rs. .. .. | 20 | 11 | 0 |

No. 3. Estimate of the probable expense for making a hut, with Wooloo straw, measuring 15 feet long and 7½ feet broad in the inside,—the walls Gurran sticks with mud.

| | Sa. Rs. | A. | P. |
|---|---|---|---|
| 2 Choppers, .. .. .. | 2 | 0 | 0 |
| 15 Bamboos, .. .. .. | 2 | 4 | 0 |
| 10 Seers Jute twine, .. .. | 0 | 10 | 0 |
| 2 Khahuns Wooloo-straw, .. | 3 | 0 | 0 |
| 360 Gurran sticks, .. .. | 3 | 0 | 0 |
| 16 Days Gurramies, .. .. | 1 | 5 | 4 |
| 5 Ditto Coolies, .. .. | 0 | 8 | 0 |
| Total, Sa. Rs. .. .. | 12 | 11 | 4 |

No. 4. Estimate of the probable expense for making a hut, roofed with Tiles, and with Mud Walls, measuring 15 feet long and 7½ feet broad.

| | Sa. Rs. | A. | P. |
|---|---|---|---|
| 50 Cubits mud walls 15 feet long and 6 feet high, at 12 Rs. per 100 cubits, .. .. | 6 | 0 | 0 |
| 30 Bamboos at 15 Rs. per 100, | 4 | 8 | 0 |
| 4200 Thatching tiles at Rs. 1 : 4 per 100, .. .. | 5 | 4 | 0 |
| 20 Ditto Edges, .. .. | 0 | 4 | 0 |
| 25 Days Gurramies at 4 Rs. per month, .. .. .. | 3 | 5 | 3 |
| 3 Ditto coolies at 3 Rs. per month, .. .. .. | 0 | 4 | 9 |
| 1 Ditto Bricklayer, .. .. | 0 | 2 | 6 |
| 1 Md. soorkey, ½ md. chunam, | 0 | 5 | 0 |
| 60 Durmah mats, .. .. | 1 | 12 | 0 |
| Total, Sa. Rs. .. .. | 21 | 13 | 6 |

No. 5. Estimate of the probable expense of making a tiled hut, walls Cutcha Pucka, 15 feet long and 7½ feet wide.

| | Sa. Rs. | A. | P. |
|---|---|---|---|
| 925 Solid feet brick wall, Cutcha Pucka, with plaster, at 6 Rs. per 100 feet, .. .. | 55 | 8 | 0 |
| 30 Bamboos at 15 Rs. per 100, | 4 | 8 | 0 |
| 420 Khuprail tiles Rs. 1 : 4 per 100, | 5 | 4 | 0 |
| 20 Ditto Edges .. .. .. | 0 | 4 | 0 |
| 25 Days Gurramies at 4 Rs. per month, .. .. .. | 3 | 5 | 3 |
| 3 Ditto Coolies at 3 Rs. per month, | 0 | 4 | 9 |
| 1 Ditto Bricklayer, .. .. | 0 | 2 | 6 |
| 1 Md. soorkey, ½ md. chunam, | 0 | 5 | 0 |
| 60 Durmah mats, .. .. | 1 | 12 | 0 |
| Total, Sa. Rs. .. .. | 71 | 5 | 6 |

of their officers as the Police may think requisite. To each of these an Engine may be attached, to be kept in a pucka building at the Thanna or Guard, with a proper proportion of fire-hooks, fire-bills, buckets, and such other implements as are found requisite to stop the progress of fire, with an adequate establishment of firemen or Lascars, a party of whom should be always on duty at the spot where the Engine is kept. From this party, patroles should be furnished and kept moving in all directions throughout the division, to report what is going on, and to give the earliest information of fire, that the Engine may be run to the spot with the least possible delay, and the alarm given to the adjoining division to be prepared, by every means, to stop its progress in that direction; by these means the fire would in all probability be prevented from extending beyond the division in which it commenced.

To render the use of Engines efficient in each of these divisions, and as near as may be possible to the Road, as many wells, as may be found necessary, should be dug, of a depth sufficient to afford water during the dry season, or a tank to every two, so situated as to be equally serviceable to both; a guard from the Engine establishment may there be posted (if the whole depôt cannot be placed near enough,) to prevent the soiling of these tanks, and to superintend the use of the water.

As these regulations would incur considerable expense, and probably beyond what the present assessment is equal to defray, and as the whole is for the *immediate protection* and accommodation of the Native inhabitants of that part of the Town, an increased assessment on the houses built, in those divisions, of straw, grass, or mats, or *a duty* on *straw, grass,* and *mats sold there*, might be levied, equal to discharging the additional expense of the establishment proposed.

It is by no means improbable that, on the Streets being marked out, and a declaration to the foregoing effect publickly made known, as well as that a bounty of one year's, or more, remission of assessment would be granted to such who should build their habitation in future of the materials before detailed, many, if not all, of those formerly inhabiting that part of the Town, where the fires have recently happened, and where the Regulations are first intended to take place, will be induced to adopt the recommendations of the Committee.—Traversing that part of the Town where the fires have been, it does not appear that any particular aversion exists to tiled buildings, for even in the very course of the fires there are several which still remain unhurt; the cost seems to be the principal obstacle; if then by a remission of assessment, or even an advance of cash, of the value of one year or more assessment, it would be an inducement;—it would be a point carried well worth the means employed. Although it is but a very small portion indeed of the inhabitants of the quarter bounded by the Durrumtollah, Chowringhee Road, the Burying Ground Road, and the Circular, that have been burnt out, it is nevertheless desirable that those who wish to inhabit the quarter again, may be induced to conform to

the mode of building least likely to cause a return of the calamities that have just happened.

The lines which Mr. Blechynden has been requested to take, seem the least likely of any, that could have been pointed out, to incur a very heavy expense in purchase of buildings necessary to be pulled down to form the Streets, and will facilitate the communication with the Chowringhee and Circular Roads, nearly centrical between the Durrumtollah, and Burying Ground Roads; an intersecting road, also embracing like advantages, has been traversed from nearly opposite the late Mr. Bristow's Garden by the Free School, crossing the Jaun Bazar, and opening into the Durrumtollah nearly opposite the Reverend Mr. Brown's.

One has also been traced still more to the Eastward, apparently not likely to incur any very considerable expense in the purchase of property to form it of the breadth required, intersecting the principal Road also, and thereby forming nine distinct divisions, and throwing that quarter of the Town completely open; these divisions also may be subdivided as Government or the Police may think requisite.

The Committee were ultimately led to request of Mr. Blechynden to survey and mark the direction in which they conceive the new Roads ought to be led, which work that gentleman has undertaken; but from the tediousness and labour of the process we do not apprehend it can be completed, together with a plan, under a fortnight; in the meantime Mr. Blechynden has been requested to forward to the Collector of Calcutta a list of the owners of such property as will fall within the lines of the intended Roads.

A True Copy, *(Signed)* M. G. PRENDERGAST,
*Secretary to the Committee for Improving Calcutta*

## No. 103. (c.)

*At a Meeting of the Special Committee for opening Roads, held at the Quarters of Major-General Cameron, in Fort William, the 25th June,* 1804.

*Present.*

Major-General Cameron,
Reverend Mr Brown
Captain Anbury.
Mr. Proby,
Mr. Blaquiere,
Mr Blechynden,

*Attending.*

Captain Johnstone,
Lieutenant Macleod,

Conformably to the desire of the General Committee, Mr. Blechynden surveyed and marked out two Roads, one to the Southward of Mr. Gamage's house, the other to the Northward of Mr. Smith's, and this Committee having proceeded to the spot to inspect what had been done, found that the former Road led through one upper-roomed and ten lower-roomed houses; they then proceeded to examine that to the Northward of Mr. Smith's, which interferes with four lower-roomed houses, and runs through a part of the property of Nemoo Mullick, which is very valuable. The Committee noticed that the latter Road approaches too near the Jaun Bazar Road, and forms an obliquity which should be avoided if possible; it has been also noticed that it approaches too near the Free School House, being only

thirty seven feet from it; the latter inconvenience might, however, be avoided by bringing the Road in, at the intersection A, but this will make the Road still more oblique. Under these circumstances the Committee are unanimously of opinion, that the Road originally proposed has decidedly the preference, from being more direct, and upon the whole less expensive—particularly as there is no house of any consideration to come down, except Mr. Gamage's, which is very old and cutcha.

*(Signed)* W. N. CAMERON,
THOS. ANBURY,
W. C. BLAQUIERE,
R. BLECHYNDEN,
T. M. JOHNSTONE,
J. J. B. PROBY,

(A true Copy.)

*(Signed)* M. G. PRENDERGAST,
*Secretary to the Committee for Improving the Town of Calcutta.*

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## No. 104.

To JOHN LUMSDEN, ESQ.

*Chief Secretary to Government, &c. &c.*

SIR,

By order of the Committee for improving the Town of Calcutta, I have the honour to enclose an Extract from a Report given in by the special Committee appointed to consider the most effectual means of Draining the Town, and to request that you will submit it, for the consideration of his Excellency the Most Noble the Governour General in Council.

I am further directed to submit, for the information of his Lordship in Council, that the General Committee beg leave to recommend the measure suggested in the enclosed Extract.

I have, &c.

CALCUTTA,
*7th July*, 1804.

*(Signed)* M. G. PRENDERGAST,
*Secy. to the Committee for Improving Calcutta.*

Extract from a Report given in by the special Committee appointed to consider the most effectual means of Draining the Town of Calcutta, received the 7th July, 1804.

"A general map of the Town, together with a table of levels, having been laid before the "Committee, Resolved—That a Copy of the general Plan be made, including the several "streets, and that the levels, as far as they go, be marked upon "those streets. But as the present tables do not extend to the "whole of the principal streets,—agreed, to request of the gene-"ral Committee, that a letter be written to Government to solicit "the assistance of a professional gentleman, aided by an as-"sistant, to enable this Committee to have an accurate table of "levels prepared for the purpose, and that a remuneration be "recommended to be given to those gentlemen for their trouble "during the period they may be employed on this business."

(A True Extract)

*(Signed)* M. G. PRENDERGAST,
*Secy. to the Committee for Improving Calcutta.*

# No. 105.

## To MAJOR-GENERAL CAMERON, AND COMMITTEE FOR THE IMPROVEMENT OF THE TOWN OF CALCUTTA.

Gentlemen,

I am directed by his Excellency the Most Noble the Governour General in Council to acknowledge the receipt of your letter dated the 4th instant, with the documents to which it refers, and to communicate to you the following observations and orders on the several questions therein stated, with respect to the means of improving the Town of Calcutta, and of preventing the recurrence of fires in that part of the Town which is inhabited by the natives of India.

2. The appointment of a special Committee for the purposes stated in your letter is approved by His Excellency in Council, and the reports which you have submitted from the special Committee appointed to survey the quarters of the Town recently burnt down here, afforded much useful information.

3. The arguments stated in your Report, with others which it is not at present necessary to enumerate, manifest the expediency of commencing the projected improvements in the construction of the houses and streets in that quarter of the Town which is situated to the Southward of the Durrumtollah, and the lines which you have proposed for the direction of the new streets intended to lead from the Chowringhee to the Circular Road, and from Durrumtollah to the Burying-Ground Road, appear to be judicious. It is extremely desirable that these streets should be opened at as early a period of time as may be practicable, and that they should be immediately constructed of pucka brick with sufficient drains on each side.

4. Before the drains from the proposed streets shall be laid, the Governour General in Council wishes that the general question with respect to the best means of draining the Town of Calcutta should be determined. His Excellency in Council accordingly desires that the special Committee appointed for the consideration of this question be requested to prosecute their inquiries on the subject with all convenient expedition, and that their Report, with the observations of the General Committee, be submitted for his consideration and orders as soon as may be practicable. It does not however appear to be necessary that the opening of the new streets should be delayed on this account, as the work to be performed, before the drains can be constructed, will certainly require a considerable period of time.

5. It is proposed by the Committee that in the quadrangular spaces, described in the plan between the great Roads, tanks shall be dug, and that small avenues shall be made in a direction parallel to the great Roads, at the distance of 150 or 200 feet asunder. The adoption of this plan, however desirable it may be with the view of ensuring the attainment of the objects in the contemplation of Government, appears to the Governour General in Council to be impracticable. The ground is the property of different individuals, who cannot be compelled to allot their estates for building according to any prescribed plans, and the purchase of the whole, with the houses now standing thereon, would require the expenditure of a sum of money too considerable to admit of any attempt for that purpose.

6. The construction of the proposed great Roads from North to South, and from East to West, with the digging of tanks and wells in convenient situations in the intermediate spaces between their intersections, and the construction of avenues for the passage of Fire Engines from the tanks and wells to the great Roads, appear to the Governour General in Council to comprise the utmost extent to which the intended improvements can at present be accomplished.

7. The disposition of the roads or passages which are private property, the allotments of the ground for houses, and the size and situation of the houses, must be determined by the convenience or by the choice of the proprietors. It may however be useful after the completion of the great Roads or Streets, and of the new Tanks, to circulate among the proprietors of the ground, plans for the further improvement of the intermediate spaces, and a system might be laid down which, with the concurrence of the proprietors, might greatly improve the health and convenience of the Town, without injury to private property, or offence to the prejudices of the Natives.

8. The ground required for the great Streets and avenues, and for the proposed tanks and wells, must necessarily be purchased by Government. The Board of Revenue will accordingly be directed to communicate with your Committee on this subject, and to take measures for completing the purchase as soon as circumstances shall admit, submitting an estimate of the expense for the consideration and orders of His Excellency in Council.

9. Great advantage will undoubtedly be derived from a sufficient number of tanks in proper situations; they will give facility to the exertions of the officers of Police in extinguishing fires, and it may be expected that the general salubrity of the Town will be improved by the removal of the pools of stagnant water, which may be filled up with the earth to be excavated in digging them. It would be the duty of the officers of Police to see that the public tanks were preserved free from pollution, and the purity of their water would unquestionably preserve the native inhabitants of Calcutta from many disorders to which they are now subject, from the impracticability of obtaining in the vicinity of their dwellings any good water to allay their thirst, or even any water fit for culinary purposes; the necessity of digging so many tanks, as is proposed by your Committee, appears however to be doubtful. The determination of this question, as well as the situation and size of the tanks, may be postponed until you shall have made further inquiries on the subject, and until an estimate of the expense of the projected improvements shall have been received.

10. The maintenance of Fire Engines in each ward, with a small establishment under the orders of the Police for working them, will certainly constitute an essential branch of the ultimate arrangement for the prevention of fires. The number of engines which will be required, with the places where they may be deposited with most convenience, and the establishment to be attached to each engine, may be determined when the proposed tanks and wells shall have been completed. In the present condition of the Town, the impossibility of procuring water, at the season when fires are most prevalent, would render the engines useless.

11. The Governour General in Council has considered the circumstances stated in your letter with respect to the materials of which the houses, recently destroyed by fires, ought to be constructed. It is certainly desirable that all houses of this description should be rebuilt of mud or pucka walls with tiled roofs, but it is probable that no encouragement, which could be offered to the native inhabitants to adopt this plan of

building, would suffice to render the plan general, and it may be questioned whether the majority of them could obtain the means of erecting such houses, in the first instance, however economical they might ultimately prove. It is likewise admitted that houses thatched with straw afford at all seasons of the year more comfortable accommodation than houses having tiled roofs, and it may thence be inferred that the use of the latter would not become general, even if the tax on houses and ground rent were remitted to all who should construct tiled buildings for their residence. Under these circumstances the Governour General in Council has determined that it shall be left to the Native inhabitants of Calcutta who have suffered by the late fires, to rebuild their houses as they shall think proper, but the Magistrates of Calcutta are at liberty to recommend to their adoption such an arrangement of the new houses and streets as may be best calculated to ensure the easy extinction of accidental fires, and at the same time may be compatible with their pecuniary circumstances.

I am, &c.
(*Signed*) JOHN LUMSDEN,
*Chief Secretary to the Government.*

FORT WILLIAM,
*July 24th*, 1804.

## No. 106.

### EXTRACT.

*Proceedings of the Committee upon the Fever Hospital and Municipal Improvements.*
*30th July*, 1839

" The Chairman stated to the Committee that he regretted to say that he had a message " from Sir Edward Ryan, which he had no doubt the Committee would receive " with the same regret with which he delivered it.

" Sir Edward Ryan desired him to state, that the business of the Court had pressed so " severely on his attention during the last vacation, when a very heavy and impor- " tant cause stood over for the consideration of the Judges, and the business of the " Court during the last term, and sittings, had so entirely occupied his time, that " he had not had it in his power to read even the Report, much less the Evidence " with which it was necessary to compare it.

" That in these circumstances he found it impossible to take any part in the discussions " of the Committee, nor would it be possible for him to do so in the short interval " before the 10th proximo, when he was to leave Calcutta for the Upper Provinces— " that he therefore requested of the Committee to dispense with his further atten- " dance, wishing not to delay the Report—that for that part of the Report which contained the opinions expressed in the Report made to the General Commit- " tee by the First Sub-Committee on the establishment of Fever Hospitals, and " for that part of it as now printed, regarding the Assessment Collection and Ap- " propriation of the Taxes, from page 129 to 185, he considered himself jointly " responsible with the other members of the First Sub-Committee, in whose report to the General Committee he entirely concurred."

" The Chairman was unanimously requested to state to Sir Edward Ryan, the deep " regret which the Committee felt at being deprived of the great benefit of his " assistance in this the concluding part of their labours."

NOTE.—Previous to the 30th July, 1839, the Committee had considered and approved the printed Report up to page 83

BISHOP'S COLLEGE PRESS.

# ADDENDA TO APPENDIX (F.)

TO

# REPORT OF COMMITTEE

UPON

# THE FEVER HOSPITAL

AND

# MUNICIPAL IMPROVEMENTS:

CONTAINING

# MISCELLANEOUS EVIDENCE AND PAPERS.

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CALCUTTA:

Bishop's College Press.

1839.

# ADDENDA TO APPENDIX (F.)

Contents

# ADDENDA TO APPENDIX (F)

## No. 107.

No. 465. To WM. COBB HURRY, ESQ.

*Secretary to the General Committee of Municipal Inquiry.*

SIR,

Judicial Department. I am directed by the Honourable the Deputy Governor of Bengal to forward to you, for the purpose of being laid before the Committee for their information and guidance, the accompanying copy of a letter from the Officiating Secretary to the Government of India, dated the 7th instant (No. 43) and of its enclosures.

I am, Sir,

Your obedient humble servant,

F. J. HALLIDAY,

*Offg. Secy. to the Govt. of Bengal.*

FORT WILLIAM,
*The 27th February*, 1838.

## No. 107. (A.)

No 43. To F. J. HALLIDAY, ESQ.,

*Officiating Secretary to the Government of Bengal.*

SIR,

Legislative. In continuation of Mr. Secretary Macnaghten's letter of the 8th August 1836, No. 202, to the address of Mr. Secretary Mangles, I am directed by the Honble. the President in Council to forward to you, to be laid before the Honble. the Deputy Governor, the accompanying copies of a letter from the Officiating Secretary to the Indian Law Commissioners, dated the 19th ultimo, with its enclosures, and of a Resolution recorded thereon by His Honor in Council under this date, and to request that the necessary communications, as indicated in the latter document, may be made to the Committee of Municipal Improvements, and to the Chief Magistrate of Calcutta.

I have, &c.

ROSS D. MANGLES.

*Offg. Secy. to the Govt. of India.*

COUNCIL CHAMBER,
*The 7th February*, 1838.

## No. 107. (B.)

No. 95. To R. D. MANGLES, ESQ.,

*Officiating Secretary to the Government of India.*

SIR.

Legislative Department. I am directed by the Indian Law Commissioners to request, that you will submit for the consideration and orders of the Honble. the President in Council the following observations with reference to the subject* of the first packet enclosed in Mr. Macnaghten's letter dated the 8th August 1836, to the address of Mr. Millett. The subject of Mr. Macnaghten's letters of the 25th of April 1836, (No. 90) and 30th of May 1836, (No. 149) will also be noticed in this letter.

* Certain Municipal Laws proposed by the Chief Magistrate of Calcutta.

2. Mr. McFarlan, the Chief Magistrate of Calcutta, is of opinion that several new laws are requisite for the better government of the Town of Calcutta.

3. The first law which Mr. McFarlan suggests, is one for enforcing the registration of all Coolies, (porters,) Carts, and Karanchees (hackney coaches) under a system similar to that established for palankeen bearers by the Calcutta Bye-Law, passed on the 27th of April 1827. This system, besides enforcing registration, and the wearing of a badge, regulates the charges demandable, and the places whereat to ply. The Law Commissioners assume, that no special laws interfering with the affairs of any class of the community ought to be made, unless it be clearly shewn that there is some peculiarity in the case of that class which renders the general law, which is sufficient to repress the offences of other classes, insufficient for that class, or unless some preponderating good can be reasonably anticipated from restricting that particular class by special Regulations, which could not be anticipated in an equal degree from putting all persons under similar restrictions ; so much seems to be not only due in fairness to the individuals most interested, but also as a matter of public expediency ; for no unnecessary difficulty can be thrown in the way of persons of any one calling, without some inconvenience to people at large. If this be true, as applied to countries in which reliance can be placed in the persons who are entrusted with power, the argument is much stronger as applied to this country, in which even those powers which are unavoidably entrusted to the lower officers are liable to be so much abused, as in frequent instances to cause more annoyance than benefit to the public.

4. Mr. McFarlan seems to admit the soundness of this principle, but he says that he thinks "a strong case could be made out in respect to the Coolies of Calcutta" The only argument which he has mentioned is, that thefts have been of late frequently committed by persons plying as Coolies, but what the number of such thefts may have been within any period is not stated, nor has the nature of these thefts been stated. The Indian Law Commissioners, therefore, have not been furnished with reasons sufficient to make them believe that the evil is of importance enough to warrant legal interference, or that the mode of interference proposed would obviate the evil, for no laws will keep people from losing their property who do not take proper precautions to prevent thieves from stealing it. On the other hand, they understand that an endeavour which has lately been made by the Police to induce Coolies to wear badges was so disagreeable to that class as to drive a great number from Calcutta for several days. The interference of the Police in this matter was felt as vexatious, not to a few Coolies who were in the habit of committing theft, or to a few thieves who were in the habit of pretending to be Coolies, but to the mass of honest, hard working Coolies.

5. With respect to Hackeries, all that is said is, "that cases of Hackery drivers absconding with their load are not unfrequent." With respect to Karanchees no reasons whatever have been advanced to authorize the proposed interference. The Law Commissioners, therefore, as at present informed, see still less grounds for enforcing the registration and interfering with the freedom of these conveyances, than for doing the same to Coolies.

6. On the subject of all local regulations of this nature, the Law Commissioners observe generally, that they are inclined to receive with jealousy proposals for multiplying them. If thefts or other offences are common in any place, they think that it is seldom for want of special and local laws, and that the enactment of such laws would seldom make them less common. Still less do they think these offences likely to be diminished by the enactment of laws which must, to a certain degree, be vexatious to poor and industrious people, and which may by abuse be rendered intolerable to them.

7. Though the Law Commissioners have thus expressed themselves generally on the subject of interfering by special regulations in such matters as these in question, I am directed to state, that they wish to be by no means understood as expressing an opinion that

such laws can never be required. So much inconvenience may be felt from the want of such laws, which it might be shown would be removed by them without any corresponding inconvenience, as fully to justify their enactment; though this has not, in the present case, been made apparent to the Law Commissioners. Whether this be so or not, is strictly a matter for local inquiry, and as such, the Law Commissioners conceive that it was not the intention of the Government to require their attention to be devoted to this matter. If any regulations of this sort be thought necessary, the Law Commissioners trust that it will be practicable to provide some that will not prevent the free employment of labor and capital in these trades, and that will be little liable to be abused by the lower officers of Police.

8. The Chief Magistrate of Calcutta likewise proposes a law of the same nature for the Ferry Boats of this place, whereby none but safe boats would be allowed to ply. The Indian Law Commissioners have recommended in the Penal Code, a law which would make it penal universally to convey passengers for hire in an unsafe boat, whether the boat be unsafe by being overloaded or otherwise.* The passing of this general law would make the expediency of a local law regulating the ferry boats of this place determinable by considerations similar to those by which the expediency of such a law for Karanchees must be determined.

* Clause 267.

9. The second law which Mr. Macfarlan proposes, is one to make the cheating in Calcutta by False Weights and Measures an offence punishable by a Magistrate, instead of being, as now, only a subject for indictment before the Supreme Court. The Indian Law Commissioners hardly think this a matter of sufficient importance for a special act; but if, before the general Code of Criminal Procedure be completed, any act be passed for the improvement of the present system of criminal procedure within the jurisdiction of the Supreme Courts, by providing a less expensive, and more expeditious course than the present course, for the cognizance of several other petty offences now by law cognizable only by the Supreme Court, this particular offence would, they think, properly be so provided for in any such law. The Commissioners are inclined to think that there is good reason for a special act of this sort. In Calcutta a great number of petty felonies, and petty misdemeanors are illegally punished by the Magistrates, which could be legally punished only by the Supreme Court. In Madras a still greater proportion of the acts of the Magistrates are illegal. The Law Commissioners cannot think it proper to continue this system; a system which, by making the most reasonable exercise of a Magistrate's power illegal has, in fact, the effect of making himself and the public look upon his acts as absolved from all law, unless they be quite extravagant, or unless they affect a wealthy individual who can afford to enter upon an expensive *law-suit*. On the other hand, if the Magistrates acted legally, many hundred individuals would be put to great and unnecessary inconvenience at every Sessions, the public would be put to great and unnecessary expense, and much of the valuable time of Her Majesty's Judges would be unnecessarily occupied. This is a state of the law which, in the opinion of the Law Commissioners, ought not, if it can readily be amended, to remain unamended for so long a time as must elapse before a general system of Procedure can be matured, and become law. The Law Commissioners will give their best attention to the preparation of a special law for the improvement of the present system of Criminal Procedure in the Capitals, if so commanded by the Honble the President in Council. Indeed such a law has already occupied a good deal of their attention, in consequence of Mr. Secretary Macnaghten's letter to the address of Mr. Millett, dated the 30th of May 1836. The Commission had previously received Mr. Macnaghten's letter of the 25th of April 1836, inclosing a paper on the same subject. So long ago as in the month of August 1836, a sketch of a law for this purpose was prepared by the Commission, on which there has been some correspondence with the Judges of the Supreme Court, and the Magistrates of Calcutta.

Mr. Cameron had taken great interest in the matter, and there was a considerable difference of opinion respecting some of the principles involved in the sketch above mentioned. For these reasons the subject was postponed at first in consequence of Mr. Cameron's illness, and afterwards of his absence.

10. The third law proposed by the Chief Magistrate is one to empower the Police to remove dangerous buildings. The Penal Code* would make penal the not removing or repairing such buildings by the persons in charge of them. The power to be given to the Police in case of the failure of the person in charge to perform this duty, is a matter for the law of Procedure, but as such, it may fall within the observations made in paragraph 9.

* Clause 272.

11. Exactly similar observations apply to the fourth law proposed by the Chief Magistrate, viz. for fining owners of Public Necessaries who neglect to keep them in a proper condition,† and to the fifth law proposed by that gentleman, namely, for the punishment of dangerous Driving.‡

† Made penal by Clause 264 of the proposed Penal Code.

‡ Made penal by Clause 265 of the proposed Penal Code.

12. A point of some general importance is involved in the Chief Magistrate's sixth proposal, which is for making Cruelty to Animals penal in Calcutta, and cognizable by a Magistrate. On this subject, as far as the penal law is concerned, the Law Commissioners remark, that if cruelty to animals ought to be punishable in Calcutta, it ought equally to be punishable in every part of British India. Any law in this matter ought, therefore, not to be a local law, but a general law. In the Penal Code prepared by them, though mischief to animals of a certain value which are property, or mischief by hurting any animals whereby a certain amount of wrongful loss of property is caused, has been made an aggravated form of mischief,§ the Commissioners have not proposed to make cruelty to animals, as such, punishable in any case. The question was attentively considered by them ; and the result was, that they thought any provision of this nature inexpedient.

§ Clause 406.

13. It is not necessary, the Commissioners remark, to enter into this question generally : without expressing any opinion on the propriety of enacting laws of this nature in countries in very different states of civilization from the state of this country, they will confine themselves to a short explanation of the reasons which make them think that the enactment of any such law would be inexpedient in this country. It seems evident that no law of this sort would effect its object to a material degree where there is not a strong and active feeling in support of it amongst many of the people. But in India a law of this sort, while happily the evil against which it is directed does not exist in a high degree, would be supported by no such feeling. The people will not properly exert themselves to bring cases before the authorities even when their own interests are intimately concerned, much less will they take the trouble to bring forward cases in which they have no apparent interest. A law of this nature, if passed, would only be operative through the instrumentality of the lower officers of Police, and being one in the due execution of which no person would take any interest, it would be peculiarly liable to become an engine of extortion in the hands of those Officers.

And it would be particularly difficult to repress extortion under color of this law without in fact making the law a dead letter, for it is often difficult to distinguish between what is cruelty to an animal and what is the legitimate use of an animal ; and peons who should bring forward cases wherein a Magistrate might see no cruelty, could hardly be punished for having a different opinion from the Magistrate on a very difficult point. Were a law against cruelty to animals passed, the Commissioners are convinced that under most Magistrates, and those not the worst, it would be a dead letter. In such cases it might do little harm, but it could do no good ; under other Magistrates, they are equally convinced that it would be much oftener the means of oppressing men than of protecting other animals.

14. The Commissioners regard that generally as a vexatious system, which requires

the interference of the Police in a variety of small matters; and in India, where no confidence can be placed in the lower officers of Police, they think it the duty of the legislature to discountenance such interference, wherever it can safely be dispensed with. The matter in hand is one in which they think that this interference may be most safely dispensed with.

15. The seventh law proposed by the Chief Magistrate, is one to enable the Calcutta Magistrates to Fine Servants for Misconduct in Service, instead of imprisoning them. If the misconduct be such as to constitute an offence of itself, such as is recognized by the Commissioners as a fit subject for the Penal Law, the enactment of the Penal Code would enable the Magistrates to fine the offenders in all cases. But if it be a mere breach of contract of service, the Commissioners have already, in a note on the Penal Code,* given their reasons for thinking that such misconduct is not a fit subject for the Penal Law, and ought not to be punished either with fine or imprisonment.

* Note P.

16. The eighth law recommended by the Chief Magistrate is one to prevent the Obstruction of Public Ghauts, by boats remaining for a long time in front of them. The Law Commissioners observe that the doing so would be made punishable by the enactment of the Penal Code.† But what is, and what is not, a public ghaut, is, of course, a question of property, to be settled in each case according to its merits.

† Clause 274.

17. With reference to the manner in which it has been customary for the Calcutta Bench of Magistrates to act, in the absence of these and other laws which in their judgment ought to have been enacted, I am directed by the Law Commissioners to submit a copy of a correspondence which has taken place between them and the Chief Magistrate.‡

‡ Letter to Mr. M'Farlan 23d September, 1837. Letter from do. do. 12th Oct. 1837.

18. It occurred to the Commissioners that they had seen in the newspapers an account of some steps having been taken by some of the Magistrates, without any law empowering them to act in such a manner, to force the Coolies to register themselves; in consequence of which the Coolies abandoned the town. It also occurred to the Commissioners that they had seen reports in the newspapers of persons having been sentenced to fine or imprisonment by some of the Magistrates of Calcutta for doing what the Chief Magistrate in his letter above referred to, had stated was not legally punishable. I was accordingly directed to address the letter dated the 23d of September 1837 to the Chief Magistrate. The attention of the Honorable the President in Council is requested to the reply of that Officer, dated the 12th of October.

19. The Law Commissioners do not attach great blame to the Magistrates for having illegally punished petty offenders, who could not be brought to punishment in a legal manner without doing more harm to innocent parties by the process, than good to the public by the example. In so doing no one person was injured. The Commissioners think that in this, as in almost all cases, the proper course would have been for the Magistrates to obey the law. If the Magistrates had always done so, it is probable that a very short time would have elapsed before the present bad state of the law would have shown itself in a very strong light, and measures would have been taken for its amendment; as it is, the law, to those who judge of it from the actual administration of criminal justice, has been apparently unobjectionable in this respect, but in reality it has not only been faulty in this respect, but has introduced indirectly practical evils of no small magnitude. It has had to a great extent the same effect that the abolishing of all law would have had. It has misled Magistrates into a belief, that each Magistrate is justified in sending people to prison for doing lawful acts, if that individual Magistrate disapproves of those lawful acts; nevertheless, though the Commissioners do not approve of the course that has been adopted, even in cases wherein the acts punished were by law punishable offences, they think it an excusable course. The present Magistrates, besides, have but followed in the path trodden by their predecessors, and have long ago pointed out the faulty state of the law.

20. But the other way in which, as above observed, the Magistrates have been accustomed to act illegally, amounts to the assumption of a power to make penal laws ; and has been carried to such an extent as, in the opinion of the Law Commissioners, imperatively requires the interference of the Government. The illegal punishment of persons accused of cruelty to animals, is a strong example of what is here meant. The propriety of punishing or not punishing such symptoms of a brutal temper, is a matter for grave consideration. The legislature has not thought it proper to make such acts punishable here. The Law Commissioners, after mature deliberation, have given their opinion against the propriety of such a law. Judges, and especially the lower classes of Judges, ought to make no law, not even if the propriety of the law so to be made be universally admitted ; and certainly in this case no person can assume that the propriety of the law is universally admitted ; yet because, as the Chief Magistrate says, " One of the Magistrates has a strong feeling on this subject," innocent persons are fined and imprisoned, confessedly not because of their own offences, but because of the particular notions of particular Magistrates. And this is done under the eye of the Supreme Government, and under the immediate control of the Supreme Court.

21. The endeavour of a Magistrate many years ago to enforce a registration of Karanchees, as reported by the Chief Magistrate, is another instance of this. " He had," says Mr. McFarlan, " no legal means of doing so, and used to prevent carriages without numbers going in and out of the Town." This the Law Commissioners are told was pretty effectual. It is obvious that the Magistrate had no more right to prevent any of these Karanchees from going in and out of the Town, because it had no number, than he had for the same reason to stop any gentleman's carriage driving quietly on the Course. He and his Police officers were liable to an action of damages for every Karanchee which they stopped. The only legal remedy, however, was a suit in the Supreme Court, which it was not in the power of the poor owners of these carriages to resort to. This is the fault of the law, which ought to provide, not a fanciful, but a real remedy for every wrong. But it seems to the Law Commissioners that till such a real remedy be provided by the law, it is especially the duty of the executive government, though it cannot prevent its officers from doing wrong occasionally, to prevent them from pursuing systematically a course of wrong doing.

22. The attempt made lately by the Chief Magistrate and the Superintendent of the Police to induce the coolies to wear badges, seems not to have been, on the part of those officers, an open and intentional violation of law like the cases above mentioned. For not following the advice of the Police in the matter of wearing badges, the Law Commissioners are told that " no person was apprehended and punished *by the authority of any Magistrate*." Of this the Law Commissioners are convinced, but they fear that the subordinate officers of Police, without the authority of any Magistrate, must have been guilty of some acts of oppression, otherwise they are unable to account for the difficulty of procuring coolies in Calcutta, which undoubtedly existed at the time alluded to. This seems to them an example of the danger, which is every where considerable, but which in India is extreme, that is to be apprehended from permitting the most respectable officers to accustom themselves to act unlawfully, no matter how good the motives may be which induced them to do so; the lower officers are always too ready to follow an example so set, and it must be difficult for their superiors in such a case, to check them effectually. The distinction betwen a lawful and an unlawful act of authority is palpable, but a superior officer who is daily showing his own disregard of that distinction cannot well refer to that criterion. On the other hand, the distinction between more or less indiscretion in the unlawful exercise of authority is far from being palpable.

23. It will be sufficient, in order to shew what the opinion of the Law Commissioners is regarding such unlawful acts on the part of public servants, to refer to clauses 144

and 145 of the proposed Penal Code prepared by them. Where a person is actually confined in consequence of such an act, the punishment is still more severe than that provided by those clauses. A Magistrate who, knowing that such a proceeding was unlawful, should from his strong feeling on this subject, cause a carter to be imprisoned for ten days for cruelty to his bullock, if the proposed Penal Code were the law, might be sentenced, under clause 335, to fine and to imprisonment for three years and one month, and if prosecuted, could not be sentenced to a less punishment than imprisonment for six months and ten days.

24. The Law Commissioners have thought it right, as the practice observed upon has become known to them, to express themselves thus fully regarding it, since it is needless for them to weigh the propriety of laws, and for the legislature to enact laws, if each one of those who have to administer the law is allowed, in the vast majority of cases that come before the criminal tribunals, virtually to make and unmake what laws he pleases. They believe that the practice in which it is known that some Magistrates indulge of disregarding the law, and acting each according to what he thinks the law ought to be, is too common a practice in India, and that it is by no means confined to Calcutta, or to the jurisdiction of the Supreme Court. They feel some of the ill effects of that practice, when in the performance of their own proper duty, they make inquiries concerning the present state of the law.

25. The Law Commissioners beg further to suggest the propriety of ascertaining whether any persons be now in confinement in Calcutta, as a punishment for what the law has not made punishable, whether for cruelty to animals, or any other act, or any omissions. If there should be any persons in such confinement, it would seem just to release them without delay.

I have the honor to be, &c.

*(Signed)* J. P. GRANT,
*Offg. Secretary.*

INDIAN LAW COMMISSION.
*The 19th Jan.* 1838.

## No. 107. (c.)

No. 69.

To D. M'FARLAN, ESQ.
*Chief Magistrate of Calcutta.*

SIR,

The Indian Law Commissioners being about to report to Government upon the subject of your letter of the 26th of July, 1836, to the address of the Secretary of the Government of Bengal, direct me to request that you will favor them with answers upon the following points.

2. Your letter above alluded to, contains suggestions for the enactment of several legal provisions connected with the Police of Calcutta. The first suggestion is "for subjecting Coolies or Porters to a system of registry similar to that established for Bearers by the Bye-law of 27th April, 1827." Hackeries, or common Bullock Carts, and Karanchees, or Hackney Coaches, are also included in the same suggestion. You are requested to inform the Indian Law Commissioners whether in practice any registration of Coolies, Hackeries, or Karanchees is actually enforced, or attempted to be enforced; and if so, how far such registration is enforced, or by what means it is attempted to enforce it. The Indian Law Commissioners presume that on the date of your addressing the Government of Bengal

upon this subject, you were not aware of any law authorizing the enforcement of the system then recommended by you, and they are not aware of any such law having been since passed; nevertheless they are informed that it has lately been attempted to introduce some plan of enforcing Coolies to register themselves, and that Coolies have been apprehended by the Police because they exercised their vocation without having registered themselves. If there be any law authorizing the apprehension of unregistered Coolies, you are requested to point it out to the Commissioners, and to explain in what points the new law which you propose may differ from that law. If there be no such law, you are requested to inform the India Law Commissioners when the existing practice commenced, and with what punishment persons are visited or threatened who may object to obey the orders of the Police on this point.

3. Another legal provision which you have proposed in the same letter, is the making Cruelty to Animals penal, stating that according to your belief, "cruelty to animals is no offence in Calcutta." The Law Commissioners are not aware of any law having been enacted on this subject since the date of your letter, nevertheless they have observed it reported in the public papers that a person was a few days ago sentenced to imprisonment in the House of Correction by one of the Magistrates of Calcutta for cruelly beating a bullock. The Law Commissioners beg to be informed as to the correctness of the account given of this case. And if it be correct, they request that you will inform them in respect of the infliction of punishment for cruelty to animals upon the same points as those on which they have requested information as to the enforcement of the registration of Coolies, Hackeries, and Karanchees.

4. A third suggestion in your letter is the enactment of a law authorizing the Magistrates to punish persons who cheat by using False Weights and Measures. The Law Commissioners understand from your letter that you interfere in such cases, though other Magistrates decline to do so, and that you believe that the punishment can only legally be inflicted in such cases by the Supreme Court, on indictment; you are requested to state what sentence you pass on persons discovered to have cheated by false weights and measures, how the sentence so passed is enforced, and when the practice of the Magistrates punishing such persons commenced.

5. A fourth suggestion is the enactment of a law authorising the Magistrates to fine the owners of Public Necessaries when those places are not kept properly cleaned. You say that the Magistrates are constantly obliged to exceed their lawful authority by fining such persons, though they have no power that you know of, to do so: you are requested to state when this method of punishing persons originated, what is the amount of fine usually imposed, whether or not payment is ever declined, and, if declined, how it is enforced.

6. With respect to the above two last classes of cases, the Commissioners beg to know if you be aware of any instances in which process by indictment has been adopted.

7. A fifth suggestion in your letter is the enactment of a law prohibiting the plying of Ferry Boats, unless sound and well manned, and not overloaded, and the insuring its execution by the registration of such boats. A sixth suggestion is the enactment of a law to empower the Police, after due notice, to remove buildings, or parts of buildings that may be in a dangerous condition. A seventh suggestion is the infliction of a penalty for dangerous driving, even though no person may be hurt thereby. An eighth suggestion is the modification of the Bye-law of 13th April, 1816, whereby Magistrates are authorized to sentence servants to imprisonment for misconduct in service, so as to empower the Magistrates to sentence such servants to fine instead of imprisonment, when they may think fine the more appropriate penalty. A ninth suggestion is the enactment of a law to give the Police adequate legal power to prevent boats from remaining for a length of time at public ghauts.

8. In respect to the classes of cases to which the five last suggestions relate, the Commissioners beg to be informed what the practice of the Magistrates actually is; that is to say, whether the Police avoid interfering beyond the limits of their lawful authority, or whether, as in the preceding classes of cases, they illegally assume a power of interfering. In the latter case, you are requested to inform the Commissioners in respect of each of these classes of cases upon all the points upon which information is required in the last part of the second paragraph of this letter, in respect to the registration of Coolies, Hackeries, and Karanchees.

9. With respect to any of the above classes of cases in which the practice may be for the Magistrates and their subordinate Police Officers to interfere in matters beyond their authority, you are requested to state whether you are aware of such an unauthorised exercise of power ever having been visited with the infliction of punishment, or the award of damages, by a competent tribunal.

I have, &c.
(*Signed*) J. P. GRANT,
*Officiating Secretary.*

INDIAN LAW COMMISSION,
*September 23d*, 1837.

A true Copy.
(*Signed*) J. P. GRANT.
*Officiating Secretary.*

## No. 107. (D.)

To J. P. GRANT, ESQ.
*Secretary to the Law Commission.*

SIR,

I have the honor to acknowledge receipt of your letter of 13th* September on the 7th October, and to reply to the several paragraphs of your letter seriatim as follows:—

* Should be 23rd.

2d. para.
On registry of Coolies, Hackeries, and Keranchees.

2. Captain Birch and myself despairing of deriving aid from legal enactments, about two months ago thought that we might carry through the system of registering Coolies without the aid of any law, and at a very small expense to Government. We thought if we could induce some coolies in particular bazars to wear a badge with its number, the advantage which they would enjoy of being selected for employment would speedily induce others to come forward, and that we should thus be able gradually to introduce the system. It did take effect, but the jealousy of the Custom House Coolies prevented its extension. No person was apprehended or punished by the authority of any Magistrate or the Superintendent. Had any been, I should certainly have been called upon to set the matter right. The principle on which we acted was, that the enjoyment of a benefit would induce registry. The only punishment that we ever contemplated was to deprive of the badge any cooley who stole what he was carrying, or otherwise misconducted himself, independently, of course, of any other punishment to which he might be liable. We are afraid now that we cannot go on without a law.

3. No registry of Hackeries has ever been attempted, but the cases of Hackeries absconding with their loads are not unfrequent. The main check to the frequency of this kind of theft is, that mercantile houses (their great employers) engage carts through a Sirdar of their own, who is under security to them to make good all losses.

4. Mr. Blaquiere many years ago endeavoured to register Karanchees: he had no legal means of doing so, and used to prevent carriages without numbers going in or out of the Town. This was pretty effectual in regard to making Karanchees bear a number. Lists of the owners were kept in the office.

Marked B. 5. In further elucidation of this principle I add extracts* of a correspondence with Government on the subject of Bhurs. We have not yet set the scheme in operation, and with reference to the experiment in the case of Coolies, we are under some apprehension that we shall fail here also. The great obstacle to all such improvements is the Indian Banyan system: the influential merchant trusts all such details to him, because, when any thing wrong comes to light, he is responsible. If no distinct discovery is made, every thing passes smoothly, and the merchant in Europe or China, or the ship, is made to bear the loss arising from Calcutta stealing. We lately discovered, by the treachery of a thief against his fellows, that a chest of opium whilst in the Bhur had been gutted and filled with stones. The vessel had to be half unloaded before the chest was found. The merchant here would have been safe, but for the said treachery. His Banyan paid the value, and the thieves were sent to the House of Correction. The captain could not stay to prosecute before the Supreme Court, and the evidence of the merchant was had only under the impression that it could be compelled.

3d. para Cruelty to Animals. 6. One of the Magistrates has a strong feeling on this subject: miserable jaded oxen, worked to the point of death, and covered with sores, are occasionally brought into the Police, and the drivers fined. There is no law to authorize this.

4th para. False Weights & Measures. 7. The principle upon which my interference rests in these cases is one of pretty general application through the whole business of our Police. When it can be explained to a party that an heavy penalty is attached to an offence when tried by a competent tribunal, it seems not unfair to tell him that if he desires it, he will be sent there for trial. He is generally very glad to accept of the milder alternative, and to be fined, or otherwise punished at once, but this kind of bargain is unworthy of the office of Magistrate, and such as with good laws no Magistrate should ever be forced to adopt.

8. The sentence generally passed on the petty dealers detected in this offence is the destruction of the weights (commonly mere stones selected by the shopkeeper or petty vender, and that pass no examination and bear no mark) and the imposition of a fine of 5 or 10 Rupees, commutable to imprisonment of two weeks. The fine has always been paid.

9. I should have been inclined to say that natives very rarely charge one another with this offence; that they have too quick a sight, and too delicate a hand, to be much cheated in such bargains. I should have said that it is the European soldier's wife who suffers. She goes about the Bazar and prices her sugar and rice, and comes to a man who sells very cheap in her estimation, but makes up in smallness of quantity for the lowness of the rate. I must however remark that the Magistrates whom I have consulted entertain a much stronger opinion than I do on this subject.

10. It is not easy to say when the practice of punishing on this class of cases began In former times we had a Clerk of the Markets, who used to exercise pretty summary vengeance upon all found with false weights; this was abolished in 1820, and I confess I rather concur in the principle of the resolution of Government of that date. I do not recollect any indictment being preferred, nor does Mr. Blaquiere.

11. My opening remarks on this head extend to thefts, and even burglaries. Cutting a latch and stealing a brass lota in a dwelling house at night is a burglary. We sometimes punish them with six months' imprisonment in the House of Correction. The poor injured man is too glad to escape with the loss of a day's labour, instead of weeks lost to labour and accompanied by wearisome attendance on our Office, and the Supreme Court, and the thief is of course not sorry, nay, even Judges of the Supreme Court are well pleased; and though I never could obtain any such public opinion, the remark has been current from the days of Sir F. Macnaghten, "why do the Magistrates trouble us with such frivolous cases."

Marked A. 12. On this subject I copy as appendix part of my Annual Report for 1833.

13. These Necessaries are kept by a low class, who line a cottah or two of ground and on it place their wretched mat subdivisions, generally with a tiled floor. Their means of cleaning them are primitive, and they constantly become sources of annoyance to a neighbourhood. A respectable attorney was annoyed with one behind his house in Esplanade Row (at the South end of Cossitolah) and he brought an indictment for a nuisance. I believe there was a verdict, but the Judge said that such a place could not be declared a nuisance if properly looked after. The nuisance was ordered to be abated; ultimately the place was abandoned.

5th para. Public Necessaries.

14. I suppose in most parts of the Town the spots on which the Necessaries are constructed could be bought outright for about the same sum that a prosecution in the Supreme Court would cost, about 800 or 1000 Rupees.

15. The illegal fines which we impose vary, but never exceed 10 Rupees. I have latterly caused fines imposed by myself to be appropriated to the effectual cleansing of such spots, seeing that poor creatures earning a few Rupees monthly must be crippled still more by the imposition of fines paid into the Treasury; payment is very seldom declined: three or four days imprisonment in the Town Guard is the usual punishment in default. I imagine this course has been going on for thirty or forty years, or longer.

16. I have had people brought before me on the ground of boats being overloaded, but I have found it inconsistent with common sense to punish a man for transgressing a law which has never been clearly explained to him, and in regard to which a great variety of opinions might prevail. The practical difficulty in these cases will always be to lay down the exact number of persons a boat is to be licensed to carry. I have thought of a small Punchayit, or jury process, by which the river constables, with the aid of five respectable natives, might settle the number of men a ferry boat should carry, the crew it should have, and this number should be painted on it. No fines have ever been imposed in this class of cases.

7th para. Ferry Boats.

17. We constantly assume a power of issuing notices to remove such, and occasionally, under the advice of the Superintendent of roads that the building is dangerous, have had it removed at the charges of the owner. This of course is quite illegal, and subjects us to actions for damages in the Supreme Court.

Removing buildings dangerous to the public.

18. It has generally been thought among us that the words of our Bye-Law, purposely made very wide, do not take in the case of injury to person or property from furious driving; I should think it did: but the case of wanton driving, to the terror and annoyance of quiet people, should be punishable even though no property is injured, or person hurt. Article XVI, Regulation III, of 1815 of the Bombay Code provides for this.

Dangerous driving

19. The Magistrates have not ventured to impose any punishment in the latter description of case at all.

20. The Magistrates seldom punish in this case except according to the law.

Punishment of servants.

21. I have so far interfered as to stick up boards to caution persons not to obstruct Ghauts. I am not quite sure whether a Ghaut should not be considered a *public passage* under the spirit of the 2d Section of our Bye-Law, November 1814, but to allow a boat to remain fast to it for four hours negatives its usefulness. We never punish in such cases.

Boats obstructing Ghauts.

22. The only case which at present occurs to me was that of Mr. Hoseasan and myself: we punished a runaway apprentice, and thought we had an old law of Queen Elizabeth to bear us out, the rule being, that all the Criminal Law of England in force at the time of the Charter extends to India, and that no law since made does so extend except what is made specially applicable. The Judge said it might have helped us, but that we were clearly punishable on another ground, viz. that we had not made a proper return to their writ. We had no conviction properly drawn out, and for that we were fined. This is the best illustration I can give of the rarity of such interference. We

9th para.

were very ignorant of the virtue of a "conviction," and so were our legal advisers—the first counsel and attorneys of the place.

I have the honor to be, &c.

CALCUTTA POLICE OFFICE, (*Signed*) D. M'FARLAN,
*October 12th*, 1837. *Chief Magistrate.*

(True Copy)
(*Signed*) J. P. GRANT,
*Offg. Secretary.*

## No. 107. (E.)

(Copy)

*Legislative Department, 7th February*, 1838.

Read a letter from the Officiating Secretary to the Indian Law Commissioners, dated 19th ultimo, with enclosures, being in reply to Mr. Secretary Macnaghten's letters dated and numbered as per margin,* relative to certain laws proposed by the Chief Magistrate of Calcutta, and other matters connected with the administration of Criminal justice in this City.

*Resolution*,

1. The Honorable the President in Council entirely concurs with the Law Commissioners, that no case of necessity having been made out, it is not desirable to interfere with the existing freedom of industry enjoyed by the Coolies, Carters, and Karanchee drivers plying for public hire in Calcutta.

2. His Honor in Council sees reason to believe that a law for the regulation of Ferry Boats plying between Calcutta and the opposite bank of the river is necessary for the protection of the community from the dangers to which they are exposed from insecure, ill-found, and over-crowded boats. But he thinks it advisable that before any legislative steps be taken, the Committee of Municipal Improvement now sitting, and whose Report may, it is hoped, be shortly expected, be consulted through the Government of Bengal in regard both to the necessity of the proposed measure, and to the provisions of the law which, if a law be called for at all, ought to be enacted.

3. With reference to the existing state of the law, and to the very irregular practice which is stated to have obtained, the Magistrates both in Calcutta and Madras having taken upon themselves to punish offences which can be legally punished only after conviction in the Supreme Court, at great expense and inconvenience both to the parties aggrieved, and to the public in general, the President in Council is of opinion that the Law Commissioners should be requested to lose no time in submitting for the consideration of the Legislative Council a special law, of the nature indicated in the Para of their letter cited on the margin for the improvement of the present system of Criminal Procedure in the Capitals.

4. His Honor in Council thinks it desirable that the Law to be framed, as above mentioned, should render the cheating in Calcutta by false weights or measures punishable by a Magistrate, as proposed by Mr. M'Farlan.

5. The Law Commissioners state that the offences referred to on the margin are made penal by the Penal Code now under consideration. It is not clear how far any or all of them are penal under the existing law, or how far the deficiency complained of is only one of jurisdiction on the part of the Magistrates. If there be no law under which the neglect to remove dangerous buildings and to keep public necessaries clean, or dangerous driving,

can be punished by the Supreme Court at present, the President in Council is not disposed to forestal the enactment of a general penal code by making any special provision for those offences ; but if any of the offences are punishable, the anomaly being that the offenders cannot be legally punished without disproportionate expense and trouble, His Honor in Council is of opinion that jurisdiction in such cases ought to be given to the Magistrate by the proposed special Law of Procedure.

6. The President in Council entirely agrees with the Law Commissioners that the evils which might be expected to result from a law of the nature specified on the margin, would greatly preponderate over its good effects.

7. Upon this point, also His Honour in Council concurs with the Law Commissioners, and he will call upon the Chief Magistrate through the Government of Bengal, to report what species of "misconduct in service," on the part of menial servants or others, is now punished by imprisonment by the Calcutta Magistrates. For he agrees with the Law Commissioners that "a mere breach of contract of service ought not to be punished either with fine or imprisonment," and he has great doubt whether the Magistrates ought to possess the power of punishing a servant for an act which would not be punishable if committed by an individual not a servant.

8. The subject of this paragraph will be referred through the Government of Bengal to the Committee of Municipal Improvement.

9. The observations contained in these paragraphs have the full concurrence of the President in Council. They will be communicated through the Government of Bengal to the Bench of Magistrates, with injunctions to abstain strictly in future from taking upon themselves first the making of penal laws, and then the administering of them. They will be informed that measures for extending their jurisdiction, so as to empower them to punish for all acts which the legislature considers it right and expedient to make penal, and which are not of sufficient importance to require the cognizance of the Supreme Court, are under consideration ; and that no act which the legislature does not think fit to make penal, must, on any account, be punished by them.

10. The Honourable the Deputy Governor will be requested to take immediate steps for giving effect to the suggestions contained in this paragraph.

Ordered, that a copy of the foregoing Resolution be forwarded to the Indian Law Commissioners in reply to their Secretary's letter dated the 19th ultimo, and that copies of the letter from the Secretary to the India Law Commissioners and of the foregoing Resolution be forwarded to the Honourable the Deputy Governor of Bengal, in order that the necessary communications may be made to the Committee of Municipal Improvement and to the Chief Magistrate of Calcutta.

(*Signed*) R. D. MANGLES,
*Offg. Secy. to the Govt. of India.*

(True copies)
(*Signed*) R. D. MANGLES,
*Offg. Secy. to the Govt. of India.*

JUDICIAL DEPARTMENT,
*27th February*, 1838.

(True copies.)
F. J. HALLIDAY,
*Offg Secy. to the Govt. of Bengal.*

# APPENDIX G

TO

# REPORT OF COMMITTEE

UPON

# THE FEVER HOSPITAL

AND

# MUNICIPAL IMPROVEMENTS:

CONTAINING

A COPY OF THE MINUTE, ON THE DRAINAGE OF THE SALT WATER LAKE, BY THE GOVERNOR GENERAL (LORD WILLIAM CAVENDISH BENTINCK, K. C. B.) IN THE FINANCIAL AND REVENUE DEPARTMENTS DATED 2d FEBRUARY 1830, AND ITS CONNECTED PAPERS.

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CALCUTTA:

Bishop's College Press.

1841.

# APPENDIX, (G.)

## Contents.

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# APPENDIX (G.)

## No. I.

*Minute* by the Governor General in the Financial and Revenue Departments, dated 2nd February* **1830,** *with connected papers, received with Mr. Secretary* F. J. HALLIDAY'S *letter of* 18*th September*. 1838.

Territorial Department. Consultation, 16*th February*, 1830. No. 7.

### ON THE SUBJECT OF DRAINING THE SALT WATER LAKE, AND IMPROVING THE CANAL.

1. Possessing no scientific knowledge of Civil Engineering, I shall no doubt be considered guilty of great presumption, in venturing to submit to Council a scheme for the construction of works of great magnitude and expense, connected with that art. I may be permitted, however, to say in my defence, that during the last fourteen years I have been constantly and actively employed as a Commissioner for drainage and navigation in the great level of the Fens. During this period very extensive improvements in the rivers Nene and Ooze have been and are still going on, under the direction of Mr. Telford and the late Mr. Rennie, the latter of whom has been succeeded by his sons, Messrs. George and John Rennie. These undertakings have been, in several Sessions of Parliament, the subject of long and warm contention. The opinions elicited upon these occasions from the first Engineers, together with a long practical observation of the progress and result of these measures, could not but impart some knowledge at least of general principles. The local features of that part of England bear a striking analogy to those of Bengal. There exists the same lowness and flatness of surface ; the same liability to inundation, both from the Upland and Tidal waters ; the same difficulty of drainage ; and the same impediments to navigation from the constant formation of sand banks, arising from the ever varying and enlarging channels of its rivers ; and, unfortunately, the same unhealthiness of climate. But there is this material difference, that here a gigantic character pervades the whole. The immense Ganges fed by its many tributary streams, and all taking their rise in the highest mountains of the world, varying in depth from 40 feet in the rains, to less than 3 feet, in some places, in the dry weather, running a course of above 1000 miles, has been hitherto quite uncontrolable by the art or science of man. It may however be questioned whether the sands which obstruct the mouths of the Bagherutte and Jellinghee, at the point of separation from the Ganges, their parent stream, and which during the dry weather positively interrupt all

* This Minute, together with the papers marked here as No. I. (D) No. I. (F) No. I. (G) are printed in Appendix (D) page 233 to 253 inclusive, but owing to their not having been correctly printed, and for greater convenience and uniformity, they have been reprinted in this Appendix.—J. M.

navigation, might not yield to the superior experience and science of European Engineers. But, be this as it may, in both cases the principle upon which alone any improvement can be made, must be precisely similar; and upon the present occasion, I feel confident in the correctness of the suggestion I have to offer, only so far as it has nothing of novelty in it, and that it is in strict conformity with the principles, and is in great measure an exact copy of works planned and executed by the great Engineers before mentioned.

No. 1. *Major Schalch's Memoir on a Plan for the Formation of an easy and permanent Communication by Water between the Upper and Eastern Provinces of India and Calcutta, during the dry Season.*

2. My project has reference to the Canal, which is to connect the Salt-Water Lakes with the Hoogley. This plan originated with the late Major Schalch, and is now in execution under the direction of Captain Prinsep. This work is one of great utility, very much required by the commercial interests of Calcutta, and must prove a source of prosperity to the country in general, as well as of revenue to the Government.

3. Highly however as I think of the general measure, it strikes me that the line of the Canal may be greatly improved, and that with this improvement may be connected the execution of another object of equal utility and advantage with the Canal itself, namely the draining and warping up the Salt-Water Lake, the area of which comprises eighteen and a half square miles, or about 12,000 acres.

4. By a reference to plan marked No. 2,* the new Circular Canal, now executing, is marked by a blue line, one extremity opening into the Hoogley, the other joining the Entally Canal. This latter cut was made about twenty years ago. It communicates with the Salt-Water Lake, through which there is a navigable channel, which enters a creek, directly communicating with the sea, as will be seen in the general map of the Soonderbunds No. 3,† and is within the influence of the daily tides. The depth of the water, in ordinary tides, in this channel varies in proportion to the amount of back water brought to bear upon its different parts; at the most distant point not being more than 2 and 2½ feet, while at the lower end, previous to, and at its junction with the creek, it is not less than 15 and 20 feet, and so continues increasing in width and depth till its junction with the sea. The various depths of the channel, as well as of the water in the Lake, are marked in the map, No. 2.

5. The change which I have to recommend in this plan, is, that the New Circular Canal, instead of terminating at the Entally Canal, shall be continued round the Lake, and as close to it as possible; and shall enter the creek at deep water below Bahmunghatta, that the lake shall be drained and subsequently warped up. The red line on the map, No. 2, marks the direction of the proposed new cut.

6. Before proceeding further, it will be necessary to a due understanding of the questions of drainage and navigation, which have to be considered, that a statement should be given of the levels of Calcutta, and of the adjacent country, and of the surface

* † The Original Maps or Surveys marked No. 2, and No. 3, and on which the work suggested by his Lordship is laid down, were transmitted to the Honorable Court of Directors [See note at foot of paper marked No. II. A.] but reference to the annexed Survey, copied from the original by Capt. T. Prinsep, 1828, or to that gentleman's Map of the Suburbs of Calcutta 1830, and to his Map of the Soondurbuns, or that published by Lieut A. Hodges, 1837, and to the Map annexed to the paper marked No. VI. (c) will exhibit what is desired.—J. M

and bottom of the Salt-Water Lake, as compared with the high and low water mark, in ordinary and spring tides and during the freshes in the Hoogley, in the Lake, and at Bahmunghatta. In the gauge table annexed to Capt. Prinsep's answers (No. 4.) to certain questions put to him by me, this information will be found.

7. It will be observed that the believed lowest bed of the Salt Lake is at 2, that the depth is from 1½ to 2 feet, and no where exceeds 2½ feet, that the neap tides in the Hoogley in March, are 5 feet 4 inches, and the lowest springs in March, 7 feet 5 inches below the lowest bed of the lake; in the one case giving 3 feet 4 inches, and in the other 5 feet 5 inches, fall. It is evident from this, the complete drainage of the Lake either into the Hoogley itself, or into the Canal is perfectly practicable.

8. The warping up of the Lake is a still more easy and certain operation, in as much as in the months of March, April, and May, the springs in the Hoogley are ten feet higher than the lowest bed of the Lake; and the highest rise of the river in August and September is between 15 and 16 feet.—Vide Daily Register of Tides in the Hoogley, at Calcutta from 1805 to 1828,* by James Kyd, Esq. (No. 5.)

9. Nor can a doubt be for one moment entertained of the great superiority of a deep Canal of fixed and even dimensions, with high banks serving as roads and towing paths, over a navigable shallow channel, through an open lake, only to be kept open by the use of a dredging machine, and not having the benefit of a lateral embankment, except it be made at a considerable expense.

10. In consequence of the height of the freshes in August and September exceeding the surface of the lower part of Calcutta by near six feet, and the adjacent plains between seven and eight feet, it was necessary to erect lock gates at the mouth of the Canal. This precaution would not be requisite if the Canal was cut over the dry land, and the sides raised to a level, if thought more secure, of the banks of the Hoogley itself. I consider these locks to be objectionable, in as much as when shut, they produce a suspension of the current, and a consequent deposit of silt. It may be expected that this process of silting up, so great in the Entally Canal, and in the adjoining part of the Lake, may be much diminished, when, by the New Canal, the tides will ebb and flow daily, and that during the rains there will be a more rapid current. This will no doubt be the case in the overland cut, and I think it not impossible that the bottom of the new cut, by the effect of the scouring of the water in its confined channel, may be brought to the same depth as the Hoogley at one end, and the creek at the other, or between 15 and 20 feet at low water mark. This can never be the case in the channel in the open Lake, in which the current, being unconfined, will spend much of its force, and if a rapid current is not to be obtained, the silting process may be greater than before, because the water by which the Lake and the Entally Canal are now filled, is exclusively tidal and clear; whereas the waters of the Hoogley bringing down the upland collections of a thousand miles, and passing during the latter part of its course through the rich loose soil of Bengal, contains a greater portion of deposit matter than the Humber, or any of the rivers flowing into the great estuary between the countries† of Lincoln and Norfolk.

11. It is necessary to notice Tolly's Nullah, which is now the only communication from the Hoogley and Calcutta with the Soonderbunds, and all the districts to the Eastward bordering on the Ganges and Burumpooter. The crowded state of this Canal, even to

* Note.—The Register of subsequent years has since been obtained.—Vide Map No. 4. of the Paper marked No. I. (E).—J. M.

excess at all times, proves the want of additional accommodation to the general commercial intercourse by inland navigation. By a reference to Captain Prinsep's Memorandum and Diagram, marked No. 6, the great imperfection of this channel will be at once seen. At each extremity of its course, in the deep creek to the east and the Hoogley to the west, there is great depth of water, which would probably be preserved throughout the Nullah itself, if its course was less tortuous; if the waters were properly confined by banks; if the dimensions throughout were of equal width; and if bridges having an insufficient water way, did not, by interrupting the rapidity of the current, create a formation of sand banks. The free ingress of the high and strong freshes from the Hoogley, in the rains, produces no inconvenience at the mouth of the Nullah, or to the surrounding country by inundation.

12. The drainage of Calcutta has always been an imperfect operation, but the proposed continuation of the Circular Canal will not affect this in any way. The question does not belong to this paper, and I will only generally say, that I think it susceptible of very great improvement.

13. The drainage of the Salt-Water Lake is obviously so easy a measure with the fall into the Canal at low water, that nothing need be said of it.

14. Warping is a process entirely unknown in India; and I conceive it would be very important that an opinion of some Engineer of eminence in England, conversant with the practice as observed in Yorkshire and Lincolnshire should be obtained upon this part of the subject. Captain Prinsep in the paper marked (No. 7,) has given a very ingenious plan for the gradual silting up of the Lake. I feel however confident that a much better mode of effecting this object may be pursued. In my judgment, the Lake should be *first* drained. When the water has been completely let off, it will be seen whether it is necessary to warp it up or not. It is essential, in order to render this improvement conducive to one main end of its execution, the general health of Calcutta, that there should be no stagnant water whatever. The next point to examine is whether the soil will be sufficiently good not to require the amelioration which warping would produce. It would also be necessary before the warping took place, that all the marine jungle should be entirely rooted out. If the expense of making the banks and sluices, &c., incident to warping* could be saved, the profit of the undertaking would be proportionately great.

15. I now come to the Financial part of the plan.

16. Captain Prinsep states (No. 8.) the cost of the new Circular Canal to be about ten thousand Rupees or 1,000*l.* per mile. The distance to be cut is 8 miles or 80,000 Rupees or 8,000*l.* No locks are necessary, as the country is a dead flat. Some drains through the banks might be necessary, but if these were estimated at 20,000 Rupees, or 2,000*l.* the expense would probably be more than covered.

17. The lake according to Captain Prinsep's estimate contains 18½ square miles, equal to 12,000 acres or 36,000 Bengal beegahs. The lowest rent of these lands near Calcutta is 2 Rupees per Beegah. I take the lowest amount of rent, as well as produce of the lowest value. Such land might reasonably be expected to grow Indigo,

* NOTE—In order to warp up the Salt-Water Lake to a level with the surface of the surrounding country, it will be necessary that the water introduced from the Hoogley or the Canal should stand two or more feet above the present surface of the Lake. To effect this, a bank of this height must be made round the Lake. In fact one bank of the New Canal will perform this service, and round the remainder there must, at any rate, be made a catch-water drain to receive the drainage water now discharging itself into the Lakes, and the earth from this drain will, without much additional cost, surround the whole circumference of the Lake.

Cotton, or Sugar. The yearly produce at two Rupees per beegah would be 72,000 or 7,200*l.* or very nearly equal to the whole cost of the cut. Mr. Dampier (No, 9.) the Commissioner of the Soonderbunds, in whose jurisdiction the Salt-Water Lake is situated, estimates the quantity of Beegahs at 60,000, and the rent at more than two Rupees. But it will be safer to take Captain Prinsep's estimate.

18. I think that the general salubrity of this great city, and the vast improvement to navigation by a good canal, instead of a shallow channel through the open Lake, are objects of such superior importance, that I put all gain and profit out of the question. But it would be satisfactory at any rate, even without any prospect of collateral advantage, that so much good could be attained at so little cost.

19. It is necessary to remark, that the Salt-Water Lake has been disposed of in perpetuity, paying a rent of about 4,000 Rs. to Government. The profit to the Zemindars, as I learn from the Commissioner, from the fisheries, from reeds, and from lands from which the waters have receded, amounts to about 16,000 Rupees. I learn from the same source, that the proprietors would not be unwilling to sell their property. There is a doubt whether the land as well as the water, and the right of fishery, belongs to the Zemindar or to the Sirkar. The right is about to be tried.

20. I would beg leave to propose that this Minute with its accompanying documents, may be submitted to the Honorable Court, with my humble request that the plan may be laid before Messrs. Telford and John and George Rennie, for their opinion upon its practicability, and for such suggestions and directions as they are so well enabled to give for its execution. I propose these gentlemen, because having been the Engineers in the works to which I have been a party, they will better understand my meaning.

21. I would further propose, if the Court should feel doubtful of the practicability, or if satisfied upon that head, should be unwilling to undertake it, that they will permit individuals including their servants to embark their money in the work.

22. It would be fair I think, that one half of the expense of the new proposed Cut should be borne by the Company in return for the improved navigation, and the greater increase of tolls that accrue therefrom. The proprietors of the Salt-Water Lake would of course continue to pay the same jumma to Government as heretofore.

23. I would further beg leave to state my conviction of the incalculable benefit that might be derived from the deputation to India, for two or three years, of an eminent Civil Engineer, well acquainted with all the improvements of latter years; who should visit our territories, and report upon the possibility of calling forth the hidden and dormant resources of our immense empire, by the skilful application of improved science and modern invention.

W. BENTINCK.

*2nd February*, 1830.

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## No. I. (A)

No. 1.

*Major Schalch's Memoir on a Plan for the Formation of an easy and permanent Communication between the Upper and Eastern Provinces of India and Calcutta by Water, through the Soondurbund passages and Salt-Water Lake, during the dry Season.* (For this paper, vide the first page of App. to App. G.)

Territorial Department. Revenue. Consultations, of the 28th July, 1821, No. 6,—and 16th Feb. 1830, No.—

## No. I. (B)

No. 2.

*Survey of the Salt-Water Lakes or Marshes adjoining Calcutta, by Capt. T. Prinsep, dated December,* 1828. (Vide Note at foot of page 2.)

Territorial Department. Revenue. Consultation, 16th Feb. 1830, No.—

## No. I. (C)

No. 3.

*Survey of the Sundurbuns by Ditto.* (Vide Note at foot of page 2.)

Territorial Department. Revenue. Consultation. 16th Feb. 1830, No.—

## No. I. (D)

No. 4.

*Queries put by Lord William C. Bentinck, Governor General, to Capt. T. Prinsep, Honble. Company's Engineers, and his Answers thereto*

Territorial Department. Revenue. Consultation. 16th Feb. 1830, No. 8.

His Lordship's Queries.

1. Ordinary high water mark at Chaundpaul Ghaut?

2. Ditto at spring tides?

3. Ordinary low water mark?

4. Ditto at spring tides?

5. Same four questions during the rains?

Replies.

The quantity of daily rise and fall of the tides in the river Hoogly, differs very considerably during the neaps and springs, with a gradual and daily increase from the depth of the neaps to the height of the springs; I have therefore thought it more concise to exhibit in a Diagram, annexed, the extremes of each state of tide, as observed in March and April for the dry season—August and September for the rains. In this Diagram the base of

the system of levels is taken from the average surface of those parts of the Lake least subject to change.

The river Hoogly is found at its lowest mean level in January and February. It ebbs to its lowest extreme in March. In February the mean level of the river appears to agree with the mean level of the Lake tides, as observed in the Entallee Canal : the extreme variation of the former being 9 and 10 feet, while the extreme variation of the latter does not exceed 3 feet 2 inches. During the highest state of the two waters, in August [and] September the mean level of the Salt Lake is 4 feet below the mean level of the river. The extreme variation of the river being 13 to 14 feet, while that of the Salt Lake is only 18 inches. At this time of the year, the difference between the extreme high water mark in the river and that of the Salt Lake, is 11 feet ; and the low water mark of the same tide will remain nearly the same in the river and Salt Lake.

6 Difference of high and low water mark in the Salt-Water Lake and Chaundpaul Ghaut :

This difference is found to vary as well at every period of each lunation, as at every period of the year. During the months of the greatest tranquillity, in January and February, the high water mark of the Lake tides will vary between 5 feet and 1 foot 6 inches below the high water mark of the river from the springs to neaps.

The low water mark of the Lake tides at the same time varying from 2 feet 2 inches, to 4 feet 6 inches above the low water mark of the river from neaps to springs.

During March and April, when the tides are at their *maximum* fury, the Salt Lake high water mark is frequently 8 feet below that of the Hoogly. The low water mark 6 feet above the low water mark of the Hoogly.

In the rains the high water mark of the Lake tides remains at from 5 feet, to 11 feet below the high water mark of the river.

7. Difference in point of time between high water at Chaundpaul Ghaut, and the western extremity of the Entally Canal, and Salt Water Lake?

The low water mark of the Lake tides being some times 2 feet below, at other times 1 foot above the low water mark of the river. The periods of high and low water in the Bidyadhuree river, from which the waters of the Lake are supplied, are rather before than after the same periods in the Hoogly.

From the peculiar nature of the Lake however, over which the tide spreads itself in its approach, and from which it receives an almost inexhaustible supply during its retreat, these periods are subject to great modification

When the waters of the Lake are high, the daily variation of surface is small, (6 to 10 inches) and the period of high water in the Entallee Canal approximates nearly to that of the Hoogly

When again the Lake waters are low, the daily variation increases, (to 2½ feet extreme,) the tide is sluggish, and the period of high water in the Canal is found later than that of the Hoogly by upwards of two hours; and a person starting from the mouth of the Bidyadhuree river with the flood, may on his arrival, nine hours after starting, find the flood tide not yet expended, the distance being 28 miles.

The same causes influence the *maximum* and *minimum* influence of spring and neap tides upon the Lake levels, which are found to take place four days after each change; while in the river, generally, they take place the third and fourth tide.

8. Depth of water in the Entally Canal, and Salt-Water Lake, at low water?

At the extreme low water of March, there is from 4 to 5 feet of water in the Canal near the Koolga [Koolya] bridge. At the parts where the dredging machinery is at work 2 feet to 2½ feet.

The parts of the Salt Lake immediately in contact with the navigable channel through it, (which is also its drain) are left dry at low water neap tides in the dry season. The parts more remote are never completely drained of water, and are scarce subject to a daily variation I have

made an estimate of the bed of this part of the Lake in the Diagram attached, which I believe correct at an average.

9. Depth of water in the entrance of the channel into which the Salt Lake waters pass to Seaward?

The waters of the Lake do not pass immediately from the Lake, as a basin into a discharge canal, but gradually, and by myriads of little channels, empty themselves into a channel of five miles in length, which runs in a diagonal direction through the middle of its surface. In consequence, it is found that the rapidity and dimensions of this channel, which is likewise that used for navigation, increase in a settled ratio from almost perfect stagnation and dimensions given to it artificially at the Western extremity of the Lake, to what is much more than sufficient for every purpose of navigation at the Eastern end. At Bahminghatta the breadth is 150 to 200 feet, and depth at low water 15 to 20 feet, the current always rapid.

10. Original depth and width of Tolly's Nulla?

11. Present depth and width?

The dimensions of the two Natural Creeks, which were united by an Artificial Cut, excavated by Major Tolly, are not known The Cut was probably 60 or 70 feet wide; the depth scarce lower than it is found at present, or level with what might have then appeared to be the low water mark in the Salt Creek running Eastward.

At present the bed of this Nulla is in the highest parts, upwards of 2 feet above the extreme low water mark of the river Hoogly. And in the neap flood tides of the dry season, there is found only 4 feet water for a length of 3 or 4 miles near Rasypugla, while in the ebbs the same portion of the Canal is left with only a few inches of water.

12. What is the average silting up of Tolly's Nulla per annum?

This is unknown, from the original depth of the Nulla being required. There has probably been some near Rasypugla, while other parts of the Nulla have increased in section. The failure in my time of this part of the Nulla may however be accounted for otherwise.

Ditto of the Entally Canal and Salt Lake?

This Canal receives the rubbish and washings of the Streets of the Town from the drains of the Circular Road, besides which, its current is all but

stagnant at all times. It has been deepened twice since its original excavation in 1810, and I estimate the annual sediment along its bed at from 3 to 4 inches. I have no data to ascertain the sediment in the Lake itself. It is partial, and chiefly confined to the immediate neighbourhood of the channel through it.

13. Is the silting up of each, general, or confined to particular spots; and if the latter, the reasons why?

In Tolly's Nulla, if the failure of the part near Rasypugla, has proceeded from such cause, the reason may be, that the confined section of the Canal at this part, the narrowest throughout its course, offers a check to the colored waters introduced from the river in the rains, and causes the tide to deposit the great quantity of sandy particles which it holds in suspension. In the Entallee Canal the sediment must be general, but of course is greatest at the Western extremity, into which the drains immediately conduct

14. How many acres are comprised in the Salt Lake, and unculturable marshes?

The Western Lake, the largest, contains about 18 square miles, equal to nearly 12,000 acres of land. The Eastern Lake may be taken at about 5 000.

15. Is the Salt Lake the property of Government, or individuals?

The right is, I believe, without question in favor of Government, but at present certain Zemeendars claim and enjoy the rights of fishing upon the Lake, and think themselves at liberty to make encroachments upon its extent

16 Has the mouth of the Tolly's Nulla on the side of the river been much cut away and widened by the rapidity of the descending current and by the flood tide?

I believe not at all; the contractions at the two old bridges of Kidderpoor and Allipoor, have too effectually checked the expenditure of water either way, but their contractions have by their eddies formed on each side of the bridge a kind of circular basin.

17. What is the level of the plain, general, as compared with the low water mark in the river during the rains?

The general plain of the lower Delta in the same parallel as Calcutta, is found to rise gradually towards the banks of the Hoogly, as also of every other fresh water outlet, which crosses it. The banks themselves being defended even against the highest flood.* In the interior of the Delta, where the back water creeks alone intersect the country, and there is no trace of any former large outlet of the Ganges, the rice plains will be found nearly

upon a level with the low water mark of the Hoogly in the rains, and generally subject to an inundation of a few inches from the flood tides of the back water creeks during the spring tides of all seasons, if they were not embanked.

18. What is supposed to be the lowest level of any part of the Town of Calcutta?

The lowest part of Calcutta is the Mutchooa Bazar, nearly five feet below the extreme high water mark of the river. The Cantonment of Dum-Dum is about the same level.

## No. I. (D) *(Continued.)*

No. 1. *(ditto)*

### LEVELS.

The lowest part of Calcutta corresponds with the 18 feet mark on the Tide Map of the Hoogly.

| | | | |
|---|---|---|---|
| On the 9th, 10th, and 12th of July . . . . | Four double tides, days and nights, were higher than 18 feet. | | |
| 22nd, 23rd to the 29th inclusive . . | . . Eight double tides were. | . . . . . . . . | ditto. |
| August 5th to the 12th, inclusive . . | . . Eight double tides. | . . . . . . . . | ditto. |
| ——— 19th to 27th. . . . . . . . . | . Nine ditto, | . . . . . . . . | ditto. |
| September 3rd to 10th. ... . . . . . . | . . Eight ditto, | . . . . . . . . | ditto. |
| ——— 18th to 26th. | Nine ditto, | . . . . . . . . | ditto. |

Total——46 double tides higher than the lowest part of Calcutta.

In July they would be two hours each tide, and in August and September three to four hours at the utmost, above the lowest part of Calcutta.

The ebb during these high tides is about 9 feet which is a fall, every low water, to about 6 feet below the lowest part of Calcutta.

During the year 1823, there was an inundation of the Damoodah, on which occasion, the tide did not ebb below the lowest part of Calcutta for nearly three complete days and nights.

## No. I. (D) (Continued.)

### No. 4. (ditto)

| LAND LEVELS | feet. | feet. | inches. | TIDE LEVELS. |
|---|---|---|---|---|
| Highest Level. Strand Road near Mint. | 20 | | | |
| | 19 | | | |
| | 18 | | | |
| Roads near Government House | 17 | | | |
| | 16 | | | |
| Stone at Chandpaul Ghaut | 15 | | | |
| | 14 | | | |
| | 13 | 13 | 2 | Highest rise of the Hoogly—August, September. |
| | 12 | | | |
| | 11 | | | |
| | 10 | | | |
| | 9 | | | |
| Lowest part of Calcutta—Mutchooa Bazar. | 8 | 8 | 3 | Spring floods of March, April, May |
| | 7 | 7 | 1 | Neap floods in the Hoogly in August |
| The rice plains north of the lake have a surface sloping gradually towards the Lake from about the mark 7 feet to 1 foot. | 6 | | | |
| | 5 | | | |
| The floors of the present Town Drains along the Circular Road stand between the 5 feet 1 inch and 2 feet 1 inch. | 4 | | | |
| | 3 | | | |
| | 2 | 2 | 0 | Highest Lake and Canal tides, August, September. |
| | 1 | 0 | 0 | Neap tide floods in the Hoogly—March. |
| | 0 | | | |
| | | 0 | 3 | Ordinary high water mark in the Lake & Canal—March. |
| Believed lowest bed of the Salt Lake. | 1 | | | |
| | 2 | 2 | 9 | Lowest observed neap ebb tide in the Lake and Canal. |
| | 3 | | | |
| | 4 | | | |
| | 5 | 5 | 4 | Neap tide ebbs in the Hoogly—March. |
| | 6 | | | |
| | 7 | 7 | 5 | Lowest spring tide in the Hoogly—March. |
| | 8 | | | |

# No. I. (E)

No. 5.

## *Tables exhibiting a Daily Register of the Tides in the River Hoogly, at Calcutta, from 1805 to 1828;* with observations on the results thus obtained.—By James Kyd, Esq.*

Territorial Department. Revenue. Consultation,
*16th Feb.* 1830, *No.*—

Having kept a Register of the day and night tides in the Hoogly, at Kidderpore, near Calcutta, since the year 1806, for which the nature of my business, and my establishment afforded me facilities, and the permanency of my gage fixed at the dock head, rendering the results correct, beyond suspicion or doubt—I am induced to lay them before the Society,* trusting that they may prove interesting.

To avoid the dry detail of a daily Register, I have drawn the heights of the tides in maps, shewing the state of the river throughout the year, conveying at a glance, all that is requisite to be known for every useful purpose.

The Map No. 1. is made for the year 1806-7, and I have upon the same Map, traced the tides for the year 1825-26. The phases of the moon in the latter year falling nearly on the same days, and thus enabling me to give two years together, and to shew the variation between them, at a distance of nineteen years.

Map No. 2, is similar to the first in principle, but has been chosen to shew three distinct inundations, that took place in the year 1823. The first of which was occasioned by the sea, and the second and third by the *Ganges* and *Damoda* rivers. The first was a very rare occurrence, happening not oftener, perhaps, than once in a century; the last nearly as rare, but the second occurs every sixth or seventh year.

Map No. 3, consisting of twelve parts, one for each month, is a daily and nightly record of the river, for the said remarkable year 1822-23.†

Map No. 4, gives a comparison of the range of high, and low water for successive years, from 1806 to 1827.‡

These tide-tables, formed from a Register kept for twenty-two years, establish, beyond dispute, the lowest fall and the highest rise of the Hoogly, and thus form natural points for the construction of a River Gage, for the purpose of obtaining, at all times, the levels that may be required for the formation of canals, docks, wharfs, and drains. They also shew the height of the river at all times of the year, a matter of considerable importance in the formation of public works, especially as the variation is so great, at its different periods.

I shall now advert to the local causes which affect the tides in the Hoogly. The maps commence with March, in the beginning of which the south-west monsoon sets in. With the south-west winds, the currents set up the Bay of Bengal, and gradually raise the sea, at its head, several feet, raising with it the Hoogly, long ere the freshes are felt.

* ‡ Note.--Registers of subsequent years have since been obtained by the Municipal Committee—Vide Map No. 4.—J. M

The dotted curve line in Map No. 1, will shew this rising of the sea, and river by the wind, and currents. This cause continues till October ; the pouring of the rivers into the Bay of Bengal, during the months of August and September, and the change of wind at the end of October, give the currents a set in the contrary direction, and gradually restore the sea and the river to the state they were in, in March.

The effect of the two monsoons upon the currents, and the height of the sea, in the Bay of Bengal may, therefore, be considered as that of two long unequal tides, during the year, eight months of flood, and four months of ebb.

In conformity with these periodical local causes—partial ones have a corresponding effect, thus strong southerly winds raise the tides in the Hoogly, whilst northerly ones depress them.

The freshes, or floods of the rivers, are a prominent periodical local cause, operating upon the tides of the Hoogly at Calcutta.

The Ganges begins to rise, from the melting of the snow, as early as the beginning of May, but its rising does not sensibly affect the Hoogly till the beginning of July ; at that period, so large an accession of water is thrown into the Hoogly, that its level is bodily raised both at high and low water. The last is so remarkable, that the low water of the freshes (neap tides) is higher than the high water (neap tides also) of the dry season, by several feet.

The *Damoda* and western small rivers, or mountain streams, contribute very materially to the swelling of the Hoogly, and it is, probably, the influence of the *Damoda*, the *Rúpnarain*, the *Tongoracolly*, the *Hidgelee*, and even the *Balasore* river, (the latter situated beyond the mouth of the Hoogly,) that occasions the height of the low water, by their acting as a dam, and preventing the ebbing of the waters from the Ganges, and higher streams, quickly into the sea.

There is another local affection of the tides, the cause of which I cannot satisfactorily explain. In the north-east monsoon, the night tides are the highest, whilst in the south-west monsoon, the day tides are the highest.

A conjecture may be hazarded that as, in both monsoons, the wind is generally higher during the day than in the night, that the wind in the south-west monsoon raises the day tide ; whilst in the north-east monsoon the wind, during the day, withholds and depresses the day tide ; but this is not entirely satisfactory, in as much as the wind cannot possibly be uniform, whereas the fact of the higher tides during the day in one monsoon, and during the night in the other, is beyond doubt ; besides, the latter is very much more than the former, being as much as two feet, whereas the former is seldom more than one foot. The night tides in the north-east monsoon are also more uniform in this respect than the day tides, in the south-west monsoon.

Should it appear from future observation that the wind be the cause, it will prove that the depressing effect of the northerly wind, has much more influence upon the tides, than the increase by the southerly ones ; or it may be, that the absence of the wind leaves the tide more freedom to act.

I come now to general causes.

The horizontal parallax of the moon invariably affects the tides ; when that is high, the tides are high, and vice versa, to such a degree of correctness, that allowing for local causes, I could venture to construct a table for a year in advance, that should not vary two inches, from the actual tides.

When the parallax is highest, on the second, or third day, after the full or change of the moon, the highest tide will correspond with these days, as that is the natural period of its greatest height; should the parallax be low and decreasing, the highest tide will be on the day of the full, or change; and should the parallax be decreasing, and near to its lowest, and increase again, after the natural period has passed, the highest tide will be on the fourth day, after the full or change of the moon.

The difference of effect between the high or low parallax of the moon, upon the height of the tides, is about two feet, frequently much more; and as its variation, as to the time, is shown to be four days, this is of importance to all mariners, as enabling them, in cases of danger, to ascertain by their Nautical Ephemeris, the true state of the tides. No longer need they trust to the partial observations and equally partial theory founded thereon, of Pilots and Seamen, most of whom have a notion that the dark spring tides are always the highest, that the night tides are higher than the day tides, and that the highest tide must always occur on the second or third day after the full, or change, whereas the parallax of the moon will effectually supercede this uncertainty, and either warn a mariner with his bark on a shoal not to wait till the second day, and lose the springs, or save him from despair, because these days may have passed, and induce him to wait with confidence till the fourth day, after the full, or change, for the highest tide, as the case may be.

The parallax of the moon will assuredly indicate the height of the tides all over the world; this general cause, therefore, must be applicable at all places.

The following abstract will be useful, as conveying a general summary of the tides of the Hoogly.

From the point of lowest low water in the dry season, to that of the highest high water in the freshes, is twenty feet ten inches.

The greatest mean rise of tide from low to high water mark takes place in March, April, and May, and is fifteen feet ten inches.

The greatest mean rise of tide from low, to high water mark, in the freshes, is ten feet.

The smallest mean rise of tide takes place in the freshes; and is, at neap tides, only three feet six inches.

The smallest mean rise of the tide in the dry season, neap tides, is four feet.

From the lowest fall of the river, to high water mark, neap tides, in February, is eight feet.

[Ditto, spring tides is twelve feet.]*

From the lowest fall of the river to low water, in the freshes (neap tides.) is twelve feet.

[Difference between the lowest high water spring tides in the dry season and the highest high water in the freshes is eight feet ten inches.]

The river is at its lowest, in the beginning of March.

The river is swollen by the freshes in July, August, and September, and part of October.

The freshes take off about the middle of September, and are generally out of the river, by the end of October.

NOTE.—The matter within brackets is what has been added in MS. to Kyd's printed Tables, by the late Mr. A. H. Blechynden, by whose son the Municipal Committee were favoured with a copy of Kyd's Tables, and from which the present ones have been printed.—J. M.

* During the inundation in September, 1823, the low water stood at eighteen feet six inches, the tide having ebbed only fifteen inches on that day The difference between this low water, and the high water (neap tides in February; viz. eight feet,) is ten feet six inches!!

At the beginning of November, although the freshes are out of the river, it is upwards of three feet higher at low water, than in March.

The river is in the most quiescent state during the months of November, December, January, and February; during these months, the night tides are higher, and more rapid than the day tides, and there are, on some occasions, bores at night.

The strongest flood tides, and the greatest mean rise of the tides, are in March, April, May, and June. The day tides in these months, are higher than the night tides.

The strongest freshes are in September.

In July, the strength of the flood tides is counteracted by the freshes, and this, therefore, is a moderate month, as regards tides. The bores also are moderated as a consequence.

In August, the flood tides are overcome by the freshes, and the bores are moderate; should there be a high parallax of the moon, however, the great height of the sea, in this month, will cause a considerable bore.

In September, the freshes are at their height; there is no visible tide off Calcutta, the ships do not swing up, and the river water is perfectly sweet, far beyond Saugor in the open sea. The high parallax of the moon at the equinoxes, with the great height of the sea, produces a heavy bore in this month.

### *The Bores.*

The bores in the Hoogly occur only on the highest, or at alternate spring tides; their appearance may, with certainty, be predicted by the season of the year, and the parallax of the moon. During the months of November, December, January, and February, or on the periodical ebb of the sea, when the currents are setting down the Bay, the tides, as may be supposed, are languid, and consequently, during this period, there are no bores.*

As soon as the south-west monsoon sets the currents up the Bay, the sea begins to rise, the tides become strong and high, and bores follow in their train; whenever the parallax of the moon is high on the springs during the south-west monsoon, bores will certainly make their appearance, and when strong southerly winds are added, and freshes withheld, the height of the bores will be increased.

It must be remembered that the height of the bore, is actuated by the peculiar form of the sands, and the direction, and set of the tides, in any particular reach of the river; for instance, where the channel is straight, with deep water, from side to side, and no sand-bank, there will be no bore at any time; but a mere swell on the coming in of the tide. This is the case at the lower part of Garden Reach, opposite the Botanic Garden. This is the case also off Calcutta, at Howrah Ghaut, where the back channel having lately filled up, the main channel is now confined between high banks. It is only where the main channel lies on one side, with a low sand on the other, that the bore shews itself upon the latter. This, a very few years ago, was the case opposite to Calcutta, and there was, at that time, an enormous bore, but which, as above explained, exists no longer.

* Except very rarely—In twenty-two years I have known but three instances. Agreeably to the Statement of local causes which accelerate or depress the tides, it will be obvious that during the north-east monsoon, if the winds which blow the waters down the Bay, be more than usually moderate, and the moon's parallax be high, there may be a high tide, and with it a bore, and this, agreeably to the third local cause, will happen at night. These night bores are particularly dangerous, as they are very rare, and consequently, unexpected. They may be guarded against, by always considering it possible for them to occur during the north-east monsoon at night, upon a high parallax of the moon. Agreeably to the same local cause, it is fortunate that the bores at night, during the south-west monsoon, are not so high, as in the day.

## No. I. (F)

No. 6.

### *Capt. Prinsep's Memorandum and Diagram on Tolley's Nullah.*

Territorial Department. Revenue. Consultation,
*16th Feb.* 1830, *No.* 9

The narrowest part of this Nulla, about midway between Tollygunge and Gurryahaut, has a width of between 50 and 60 feet at high water, and is left dry at the low ebbs of the dry season.

The levels in the accompanying Diagram have been assigned from continued observations upon the daily tides and annual variation at the respective places. Those of Gurrya have been connected with the instrumental levels of Captain Taylor as nearly as they could be; but Captain Taylor's levels of 1823 fix the annual variation at Gurrya at 8 feet 5 inches—so that the removal of the several wooden bridges had, as early as 1826-27, caused an increase of 10 inches in the annual variation at that place. During 1827-28 the annual variation was still 9 feet 3 inches.

The line drawn for the bed of the Nulla has been taken from the known floors under the several bridges. There is in general a greater depth of water in the space between the bridges, forming a kind of pool in which boats remain afloat during ebb tides. The best harbour of this kind is between Allypoor bridge and Tollygunge.

During the spring tides of July to October, there is no reflux from the Soonderbuns at Gurrya, from the influence of the freshes in the river Hoogly. During the dry season the tides of the Hoogly generally meet those of the Soonderbuns in some place between Tollygunge and Gurrya; the ebb towards the Soonderbuns being still superior in force to the ebb towards the river.

## No. I. (G)

No. 7.

### *Capt. Prinsep's Memorandum on the Salt-water Lakes, in the vicinity of Calcutta; with suggestions for filling them up by Warping.*

Territorial Department. Revenue. Consultation,
*16th Feb.* 1830, *No.* 10

The position of an European city of such importance as Calcutta, upon the very borders of an extent of Salt Marsh of which the insalubrity is so generally acknowledged, has often awakened the surprise of intelligent strangers; nor is it easy to adduce reasons why the recovery to cultivation of so large a tract has not, before the present moment, become an object of consideration to an enlightened Government resident on the spot.

The inhabitants of the factory of Calcutta might with some reason have looked for security in the proximity of an immense impenetrable morass upon their flank, and as a defence against cavalry marauders, would endeavour with jealous care to preserve it in the state it was. But the residents in the Capital of an Empire, which has no enemy in

the field within 1500 miles, must view it in a different light Health and appearance have long taken the place of security and defence as objects to be kept in view in the local improvements of the City and its vicinity; and there is only one way of accounting for the subject having escaped attention, which offers any probability of truth. It would seem that the idea of the Lake being necessary to the military defence of the city, has been succeeded by an impression, not altogether unfounded, and which appears yet to be rather generally entertained, viz., that the existence of this Salt Marsh in its present state is indispensable to the perfect Drainage of the City.

Upon this point then it is necessary to be most particularly informed before any measures are proposed, that would interfere in any way with the present system, whether that system be effectual or otherwise. I shall offer my observations upon this point in the first instance, and hope to place the subject in such a light, that its reference to any scheme connected with the City, will be at once comprehended.

The River Hoogly, the western boundary of the Delta of the Ganges, as well through its connection with the great river as from the streams flowing into it from the west, is subject to annual permanent freshes, commencing in June and terminating in October. In the centre expanse of the Delta there are likewise several streams, having connection with the Ganges, which are subject to the same influence—rising at the season named, according to the quantity of influx of fresh water from the Ganges.

The surface of the Delta intervening between these is divided into a perfect labyrinth by tide back-water creeks, which are subject to no other change of level during this season, than what is derived from the vicinity of the great discharge of water from the *embouchures* of the great river, and the effect of this discharge upon the tides in the upper part of the Bay of Bengal, added to the trifling discharge of rain water upon the surface of the country, immediately in contact with the creeks.

Calcutta is situated on the Hoogly, below the parallel of latitude to which these tide back-waters are found to run; for in the general slope of the surface of the Delta from its upper fork at Jellingee, to the sea, there is of course a limit beyond which the tide influence could not extend. And this City, built along the coast of the high banks of the River, which are generally above the elevation of its highest known flood, has immediately behind it an expanse over which the tides of their back-waters spread—thus dissipating part of their force and elevation.

I may mention here, that it is a general principle of these Creeks, that they either possess at their upper termination a jheel of this nature, over which they spread and dissipate their force, or else when they are connected with a continued channel, receiving some little water from the great river; the tide in its run up a long continuous channel, gradually spends itself by the length of its course and friction of the bed.

It is a question of some difficulty in Hydraulics to determine the level of the surface of the highest and also mean-tide level of these jheels, or what may be called the point of dissipation of the creek tides relatively with the summit level of the tides of the Bay from which they are fed, and when I hazard the assertion that the point is below the summit level of the parent tide even at the distance of 70 miles from the sea, which I believe is the case universally, I naturally do so with some caution, as the subject has not been considered by any mathematical writer upon the subject of Tides.

It is not my purpose to enter more particularly into the reasons that have led me to such a conclusion in this place.

The Jheels above mentioned, and the Salt Lakes in the present case, from their depression below the general surface of the country, naturally become the receptacles of all its superfluous water; and where the supply is considerable, the general level of the jheel, as also of the creeks which run up into it, is influenced in proportion during the season of such supply. In no case however does there exist a rise from such cause at all in proportion to the influence in parallel latitudes of the permanent freshes of the great river, when admitted into a branch like the Hoogly. The effect of such supply creates a general slope of the surface of the Lake or Jheel proportionate to the expenditure required; and in the creek, which is the outlet of the Salt Lake for this expenditure, the summit level is found very little (not 1 foot) above its extreme summit level in the dry months, when only the tide enters it; and the discharge is then effected by an inequality in the duration of the flood and ebb, in the same way that the fresh water of a river is carried off. The supply of fresh water which now enters the Salt-water Lakes, is found to raise its mean surface towards the centre or opposite Balyaghat, two feet.

This level is however, which would not be at first supposed, still below the summit level of the tides of the sea.

I have made the above remarks to explain particularly the nature of these back-water creeks, because in case of the removal of the lakes by their being filled up or embanked against the tide, and when a canal connected with these creeks is brought in circuit round one-half of the City to be drained, it is essential to know what will be the state of the tides under these new circumstances. Indeed the whole question of the expediency of recovering the Lake for agriculture, as well as the means to be adopted for the purpose, will turn much upon this point.

The first case to consider is—by the removal of the Lakes, and substitution of a closed Canal, as above described, to Chitpore—what would be the effect upon the present tide levels at Tarda, below the confluence of the Lake outlets and Tolly's Nulla? Also to assign the position of the summit level of the present Tarda tide upon our general tide gauge.

Upon the general principle that the extreme level in a creek, nearer the parent tide, must be above the highest surface in the lake, of dissipation, when there is no foreign supply of jheel or rain water, and no supply into this Lake, but direct from the sea by this creek; I have supposed, that the present extreme tide at Tarda in the dry season, April, May, is nearly the mark + 1; while the highest level near Balyaghaut is at O, and that the extreme levels at Tarda, and in the centre of the Lake during the rains, nearly correspond at + 2. Upon like reasoning it may be shewn, that by withdrawing the influence of the Lakes the extreme level at Tarda will be raised a little, but as the tide will have a lengthened Canal in which to dissipate part of its force, while all influence of the river is withheld, the extreme tide can never exceed what it is at Tarda at present, or +1 in the dry months, except the dimensions of the Canal are much enlarged; its highest level in the rains depending upon the method of draining the town, of leading off the waters of the country into this outlet, as also upon whether any additional quantity of water is to be thrown in for filling the lake, and where its discharge is to be allowed.

The floors of the present Circular Road Drains at the respective places—

| | | | | |
|---|---|---|---|---|
| | Head of Dhurrumtullah,.... | Standing at | + 2. | 1 |
| | ,, ,, Bowbazar, ...... | | + 5. | 1 |
| | ,, ,, Mutchooabazar,... .. | | + 2. | 4 |
| | ,, ,, Manicktullah Road, | | + 3. | 3 |
| Marhatta Ditch | ,, ,, Sámbazár Road, .. | | + 2 | 10 |

will allow of the drainage remaining, without alteration of these floors, as long as the water in the Canal does not reach above + 3 during the season of rain. It is therefore clear, that the Lake withdrawn or embanked, cannot remove any facility of draining the town when the Circular Canal brings the Sundurbund tide in circuit so immediate to its drain outlets. It remains now to provide against any possibility of their remaining above this level + 3 during the rains.

The Lake remaining as it is, and no water being admitted from the river, the highest level in the Canal, except from the small influence of drain water from the town, will not exceed* + 2, and scarce reach that mark; and this influence I consider will never, even in flowing tides, raise the Chitpore end more than 1½ foot under any circumstances.

It must now be considered that the drains, with the exception of the Dhurrumtollah,† under the new circumstances of being so much nearer their outlet, will have great advantage; and as the lowest spot in Calcutta is much above‡ the highest of these drains, there will be rather an advantage than otherwise, in now and then allowing the tide to enter their mouths.

I may therefore safely assume that any scheme may be adopted which will not raise the waters above + 3 during the rains; and that under the contemplated circumstances an additional level of a foot may thus be allowed to the surface of the Lake, for the purpose of raising its bed with sediment, without danger to the drainage.

The Salt-water Lake adjoining Calcutta covers a surface of 18½ square miles of land. From its lowness in level it is at present the receptacle, during the rains, of a considerable surface of country water; besides the more immediate drainage of the City of Calcutta. The principal influx of water is from the north and west; and in the rains, when this is at a maximum, there is an evident general slope of the surface of the Lake proportionate to this expenditure, which has been detected by the several series of levels which have been carried on at different periods.

Western 5½ Sqr Miles.
Eastern 7 ditto ditto.
Southern 6 ditto ditto.
18½ Sqr. Miles

The surface of this Lake, as may be seen in the Survey lately prepared, is naturally divided into three compartments. Two north of the present navigable§ channel and Lake outlet; and third, south of that channel. Of the two first, the western, containing 5½ square miles, at present receives the greatest influx of extraneous water from the north towards Dum-Dum and west from Calcutta; but neither yields so great a depth of water, nor presents to the eye so great an expanse free from vegetation, as the neighbouring compartment of 7 square miles, which is separated from it by a natural rise in the bed, upon which vegetation has taken root, although the surface is almost at every tide under water.

The surface of the upper and of the first named compartment, towards the Sámbazár bridge, is said by Major Schalch to have an elevation of 2 feet above what I have ascertained to be the extreme level near Balyaghaut, which would give a slope of 7 inches per mile to the surface. Now as I know this elevation to be very partial, and owing to a certain admission of tide by the Sámbazár ditches,|| I must reject such a slope, as at variance

* Note—A fall of 1 inch upon 5 square miles of the town will give 11,616,000 cub. feet water. The Canal discharge per hour, when sloping 6 inches per mile, will be 4,376,664 cub. feet. It would never be necessary to draw off an inch of water in less than three hours. The slope of the Canal being raised to 9 inches per mile, the expenditure will be 6,572,736 cub. feet per hour.

Sic in Original. J. M.

† This drain's exit has [so] no[t] violent a slope at its mouth as to do harm at present; and an elevation of 1½ of water would be advantageous to it.

‡ Lowest part of Calcutta at the mark + 8. 2.

|| Major S. took his level under the Sámbazár bridge, making no allowance for the run of 1 mile thence to the Lake, or the resistance of the several bunds through which it passes into the Lake.

with every other observation I possess relative to its slope, and particularly the velocity of its water, which certainly never attains to any thing, near what would obtain with such fall;* and I believe I shall be within the mark in assigning a slope of 3 inches per mile extreme, to the surface of this compartment during the rains generally, from the Sámbázar enclosures to the Balyaghaut Chokies. The expenditure in this case becomes 11,612,080 cub. feet per hour, with a rate of 739⅓† feet per hour. This is even much beyond what I can believe to be true. The discharge of water from all the compartments of the Lake takes place rather by spilling over the banks of the outlet channel, (which have been raised to a level sufficient to be laid bare in the low tide of the dry season by the silt left on them by the continued flux and reflux of tide,) rather than through any more defined side outlet; and it therefore becomes difficult to ascertain the exact quantity of general expenditure‡ from the Lake in any state, except by an estimate from the dimensions and rate of this outlet, which is subject to a reflux in all cases.

That the Lakes if left to themselves would in the course of time fill up of their own accord, I have little doubt; and that such process is now in activity, is confirmed by the rapid increase of vegetation upon its surface within my own knowledge. I cannot, however, learn that much ground has been gained to cultivation during the last forty years; and although the amount of yearly filling up must at the present time be much greater than it was forty years since, another period of this length will probably, unless other means are provided to increase the yearly sediment, witness a very sorry progress towards their final recovery. Unfortunately during the present state of things the influx of Jheel water, although some of it is originally derived from the coloured water of the river Hoogly, brings little or no sediment; and as the water is quite clear before it reaches the channel of outlet, its discharge checks at this time any silt from the daily tide, and also washes away much that may have formed during the dry months.

The two principles, therefore, upon which I would rely for a more effectual recovery of the Lake, and of this compartment in the first instance, are, to prevent the influx of any water that does not proceed directly from the Hoogly or from a source whence sediment is certain, as from the drain outlets; and to encourage the growth of vegetation along the banks of the channel; until, by this means, in the course of a very short time, it will be easy to form a slight embankment at small cost, and over which the water may occasionally spill.

The quantity of river water to be admitted (and consequently the dimensions of the feeder Canal,) must then be regulated by the height of the water in the Lake, which may always be lowered by a slight check to the feeder, by which means the discharge will gain upon the supply. It is my intention to propose that the water of this compartment of the Lake be kept at an average additional elevation of less than 1 foot, and§ which would injure no property in the vicinity; or what would perhaps be still more perfect, that the supply be let in during the neaps, and so restrained in the springs, that the Lake near Balyaghaut shall remain at a constant level of 6 to 9 inches above its present extreme height. I will now consider whether a feeder of 100 or 200, [Sq.] hs.|| feet of section, and excavated in a way that would secure [it] them¶ from accident or from endangering the vicinity, would ensure a sufficient supply for the purpose, and what quantity of sediment might be looked for during the year.

* Section being 15,810 square feet, or 5,290 $\times 1\frac{1}{2} \times 2 = 15,810$.
$\sqrt{\ } = 2$, $\frac{1}{6} = \frac{1}{9017}$ } Rate becomes 1213 feet per hour, or about ¼th of a mile.

† About $\frac{1}{7}$ of a mile.

‡ Section at Bamunghatta $120 \times 21 \times \frac{3}{4} = 1920$, Sq. ft. $1920 \times 5280 \times 2$, Miles per hour $= 20,375,200$, Cubic feet.

So that when the Lake is full the daily discharge cannot be less than 50,000,000, cubic feet.

§ || ¶ Sic in Original, J. M.

The surface of this division of $5\frac{1}{2}$ square miles at an average depth of 2 feet, will give its contents of water 306,662,400, cubic feet. The contents of the adjoining division must be about double this quantity. Now a feeder Canal of 100 feet section, trapezoidal, having the slope of 1 foot per mile, will run at a velocity of $1\frac{2}{10}$ mile per hour, and supply 634,600 cubic feet only in that time. Increase the fall of the surface of this feeder to 2 feet per mile, and with the additional section gained from its trapezoidal shape, the rate becomes $2\frac{4}{10}$ mile per hour, and supply 2,194,614 cubic feet per hour. I should not think it advisable to exceed this velocity. For the months July, August, September, I may safely reckon, from the known state of the tide (and with allowances for closing the feeder when the river is too high, &c.) upon a medium supply of 900,000 cubic feet for twelve hours of each day—This quantity supplied (900,000 × 12=10,800,000 cubic feet per day) would furnish a quantity equal to the present contents of this compartment in 30 days, exclusive of water brought from the drains, and therefore I might reckon it possible to fill this compartment of the lake, in the course of the rainy season, with four times its present contents of turbid water, direct from the Hoogly, by means of a single feeder of the dimensions named.

The proportion of sediment in the water of the Hoogly is at present unknown: it is therefore impossible to say what would be the quantity produced from a depth of 8 feet water. Several inches may be expected; only 2 feet average is required, but if this is not thought sufficient, it is always possible to increase the supply [by] or* enlarging the feeder, or furnishing a second: for it is quite evident that as the hourly supply of 2,000,000 cubic feet is so small, compared with what I have estimated as the expenditure along this compartment of the Lake, 11,612,080 cubic feet per hour, and a daily supply of 10,800,000 cubic feet, so small, compared with the daily discharge by the Bahmunghatta outlet, that the rise of the surface in consequence of so trifling a supply in addition, will not be 6 inches.

*Sic in Original. J. M.

It will be said that the method I have now proposed, embraces only one-third of the whole Lake; but it must be remembered that it is the one of most importance to the Town; and likely to yield the greatest return. The same feeders, when they have completed this portion, may be turned into the second compartment, and the self-same principle may be applied to the southern division, if thought necessary, by a feeder direct from the high parts of Tolly's nullah about Kaleeghát.

The river Hoogly, it must be remembered, is the only source from which turbid water can be drawn, and this only during the four rainy months, 15th June to 15th October. The quantity of sediment in the Hoogly water will bear no proportion with that in the Ganges—and the tide waters of the Soondurbuns are notoriously clear during the rains, as also during the dry season, except in the spring tides, when they have inundated the land.

I have already mentioned that during the rains there is a general slope of the surface of the lake from the north towards the present outlet. To make this outlet the feeder it will be necessary to invert the present slope or raise the level near Balyaghaut above what it is at present near Sámbázar, which must unavoidably interfere with the present drains. Besides that, by this means, as the present channel must be at once its supply and place of discharge, the supply, according to every sound principle, cannot be so constant and unremitted as if the supply were separate and at the upper end; and no hope can be formed that the bed will be raised rapidly by any means but a constant introduction during the rains of river water.

I have purposely connected the present scheme with the system of Canals now carrying on; but upon mature consideration, I can see no good reason why any alteration in those Canals should be necessary for this additional object. The discharge Canal must necessarily be the best adapted for navigable purposes, from its depth; and the constant tendency rather to increase its dimension than to fill it up; and also from its lower level, most fit to receive all drain water.

If it is said that no real efficacious method can be adopted until the whole Lake is embanked, I need only advert to the very trifling additional rise of the surface of the Lake waters necessary in the present scheme; and to mention that the adoption of such plan will, in the course of a very short time, give the means of embanking at a very trifling expense, where now such measure would be attended with very great charge and difficulty.

If the Circular Canal is made the feeder of turbid water to raise the bed of the Lake, it must unavoidably be subject to all the disadvantages I have pointed out in a former paper upon that Canal; besides that, other means must be provided to carry off the drainage of the Town. This last point alone, in expense, would deter the Government, I apprehend, from such measure—for as the low level, fit for receiving the drain water, will be in this case either the Lake itself, or the series of nullahs eastward of the Lake, tunnels under the Canal must be excavated or a second Canal of sufficient dimensions must follow the line of the Circular Canal, and be continued perhaps to the very eastern boundary of the Lake.

By the present scheme, during the dry months, when the feeders no longer serve, the tide will be allowed as before to spread upon the Lake—for I would by no means offer any check to the spreading. In this also will the action of silting up be accelerated by the Circular Canal, into which a higher and dirtier—from its rapid passage through the Canal—tide will flow from the river, and not be allowed to return.

I therefore enclose a schedule of the method I would adopt for raising the bed of the Lake, and feel some degree of confidence that the principle of this scheme, or some modification in its detail will in the end be acknowledged to offer advantages and economy beyond every other design that could be proposed for the purpose.

## No. I. (G 1)

### *Scheme for raising the bed of the Lake to a level fit for purposes of cultivation, with statement of expense.*

| | | |
|---|---|---|
| First. | A closed drain must be excavated from the Sámbázar bridge to Mohisghaut, 3 miles, to convey the present supply of Dum Dum Jheel water into the Eastern division of the Lake—Section average 90 square feet, costing about 1,200 Rupees per running mile. ... ... ... .... | 3,600 |
| | Carried over, .. .. | 3,600 |

Brought over, .. .. 3,600

Second. One feeder Canal to be excavated from Chitpore to the Western Lake. The floor at its river mouth, excavated to + 2 which will require 16 feet of digging. The floor at the lake end at (), or perhaps, 1.—25 feet broad at bottom, and trapezoidal, so that 6 feet of water gives section 200 square feet—average section of such an excavation being 530 square feet, will cost 7,680 Rs. per mile for a length of 3 miles. ... ... ... 23,040

Third. Three bridges will be necessary over this Canal for the several roads. To each bridge I would provide some contrivance for closing the Canal, estimating each at 15,000. ... ... ... ... ... ... 45,000

Fourth. Sundry expenses for preserving a channel as fast as the Lake may fill at the place of discharge from the feeder Canal; as also in embanking the side towards the discharge Canal, when sufficiently raised, also the western side, and watching the place of discharge. ... ... ... 15,000

Supervision and contingencies. ... ... ... .. ... ... 4,332

Fifth. Add the compensation for the acknowledged rights of fishery and incomes, now enjoyed upon the faith of the rights conferred by the perpetual settlement—estimate at One Lac of Rupees for the whole Lake for the Western compartment. ... ... ... ... ... ... 30,000

Total expense and outlay. ... 1,20,972

N. B. The above does not include any charge for purchase of ground for the feeder Canal, and provides only a single feeder. It will be possible I believe to find ground from that purchased for the Circular Canal, without any material sacrifice in the resale of ground, from which a certain return is calculated upon to that work.

As per contra to the above;—

The contents of the Western compartment of the Lake are 10,630 begas of land, the value of which, nett, when fit for cultivation, may be taken at the least 30 Rs. per bega yielding, ... .. ... ... } ... 3,18,900.

It would be easy to shew that the recovery of the second compartment, in surface upwards of 12,000 begas, would be still more profitable in return, as it would be free from the great expense of excavation near Chitpore and bridging the Canal. With an additional outlay of 50,000, this second compartment would yield a return of 3 Lacs; but as this part of the undertaking is remote, I waive the introduction of it in the present scheme.

## No. I. (G. 2)

| [LAND LEVELS | Feet. | TIDE LEVELS.] |
| --- | --- | --- |
| High part of Strand, | 20. | |
| | 19. | |
| | 18. | |
| | 17. | |
| Government House road. | 16. | |
| | 15. | |
| Champal Ghaut Stone. | 14. | |
| | 13. | —Highest known rise of the Hoogly—August, September, October. |
| | 12. | |
| | 11. | |
| | 10. | |
| | 9. | —Ordinary flood during the rains |
| Lowest part of Calcutta | 8. | —Highest spring flood in April, May |
| | 7. | |
| | 6 | |
| Calcutta drain floors along the Circular road. | 5. | |
| | 4. | —Lowest neap flood in September |
| | 3. | |
| | 2. | —Highest Lake tide at Balyaghaut—August, September,—also highest ebb of Hoogly in August. |
| General level of rice cultivation in parallel of Calcutta. | 1. | |
| | | Lowest neap flood of Hoogly—March |
| Base. | 0 | |
| | | Ordinary flood tide. Balyaghaut—December to April |
| | 1. | |
| Supposed average bed of lake | 2 | |
| | 3. | —Lowest neap tide ebb in Entallee Canal and Lake. |
| Lowest bed of lake. | 4 | |
| | 5. | —Neap ebb tide of Hoogly—March, April. |
| | 6. | |
| | 7. | —Lowest spring ebb of Hoogly—March, April. |
| | 8 | |

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## No. I. (H).

No. 8.

### *Captain Prinsep's Memoranda in reply to his Lordship's Questions of the 29th and 30th December*, 1829.

Territorial Department Revenue. Consultation,
*16th Feb.*, 1830, *No.* 11

The daily variation of the tide at Bahmunghatta is from 6 to 9 feet. The neap ebb-tides are generally lower than the spring ebbs, on account of the influence of the Lake. The neap-tide ebbs of February and March, will, I apprehend, stand at a level equal to nearly —6 on my gauge table ; while the spring-tide ebbs will be about the level of —5. The tides at the place Goaladunga, will be, within a few inches, the same in every respect as those at Bahmunghatta. Tides at Bahmunghatta.

Survey & sounding in the Lake

The plan of the Lake, of which two copies, on different scales, are in possession of his Lordship, was prepared upon a very accurate and minute survey, carried on by an European under my own immediate superintendence, and may be relied on for accuracy.

The soundings were also made by the same person, and have been generally verified by myself. The numbers, written as soundings on the plan, are intended rather to give the relative level of the bed of the Lake, than to denote any precise state of the tide.

Line between Tangra and Goaladunga.

The general nature of the soil on the borders of the Lake, is rather loose and crumbling, from being rotten and full of shells, but may still be considered favorable for canal cutting, with proper attention to the side slopes.

The cost of a canal of 80 or 90 feet breadth at top, and an average depth of 10 feet, will amount probably to something less than 10,000 Sa. Rs. per running mile, inclusive of every contingency, if cut on the skirts of the Lake, where the ground is dry, but still below high-water mark.

Creek below Goaladunga.

The Bayer Creek from Goaladunga to its confluence with the main Lake outlet, has, I suppose, an average breadth of 60 or 70 feet; and a sufficiency of water, at the lowest ebb, remains at Goaladunga for the common boats of the Lake trade, drawing less than 7 feet water, but not so for the larger boats of the trade. The large wood-boats, drawing 9 and 10 feet water when laden, could not conveniently navigate this Creek.

## No. I. (1)

No. 9.

To HOLT MACKENZIE ESQ

*Secretary to Government, Territorial Department, Fort William*

Territorial Department. Revenue. Consultation,
*16th February*, 1830, *No.* 12.

Sir,

The rents paid to the Zumeendars for the lands bordering on the Lake are nowhere less, so far as I can learn, than two rupees per begah; and in most of the places it will average from two rupees twelve annas, to three rupees.

2. Should the Lake be drained, as its area is upwards of 60,000 begahs, the produce in the shape of rent to the landholders would be about 120,000 rupees per annum, allowing for Waste Lands, &c. &c., but the Jhulkur and Pattee would be lost, so that the excess to their present profits would be about rupees 90,000 per annum. There would be no fear of the supply of fish for Calcutta failing, as the cultivation now being carried on in the Soonderbuns would afford shelter and places of abode for the fishermen, who at present are unable to go very far into the Waste.

I have the honor to be, Sir,
Your most obedient Servant,
(*Signed*) W. DAMPIER,
*Commissioner*.

Calcutta,
13*th Jan.*, 1830.

# No. II.

## To THE SECRETARY TO THE HONORABLE THE COURT OF DIRECTORS.

Territorial Department. Revenue. Consultation,
*16th February*, 1830, *No.* 13.

Sir,

I am directed by the Right Honorable the Governor General in Council, to transmit to you for the purpose of being submitted to the Honorable the Court of Directors, the accompanying copy of a Minute of the Governor General's, dated the 2nd instant, together with copies of the several documents therein referred to (as per accompanying list) and to request the particular attention of the Honorable Court to the subjects of the 20th, 21st, 22nd, and 23rd paragraphs of the Minute.

I have, &c.
HOLT MACKENZIE,
*Secy. to the Government.*

# No. II. (A.)

## *List of Documents referred to in the Minute of the Governor General, dated the 2nd February*, 1830.

Territorial Department. Revenue. Consultation,
*16th February*, 1830, *No.* 14.

1. Major Schalch's printed Memoir, on a Plan for the formation of an easy and permanent communication by Water between the Upper and Eastern Provinces of India and Calcutta, during the dry season.
2. Survey of the Salt Lakes, or Marshes adjoining Calcutta, by Captain T. Prinsep, dated December, 1828.
3. Survey of the Sunderbuns, by Ditto.
4. Captain Prinsep's Answers to Questions put by the Governor General.
5. Printed Tables, exhibiting a daily Register of the Tides in the River Hooghly at Calcutta, from 1805 to 1828, by James Kyd, Esq.
6. Captain Prinsep's Memorandum and Diagram on Tolly's Nullah.
7. Captain Prinsep's Memorandum on the Salt Water Lakes.
8. Captain Prinsep's Memorandum in reply to the Governor General's Questions, and estimated cost of the new Circular Canal.
9. Letter of the Commissioner in the Sunderbuns, dated 30th January, 1830, relative to the extent of the Lake, and average rent per beegah for lands in its vicinity.

HOLT MACKENZIE,
*Secretary to the Govt.*

Territorial Department,
*16th February*, 1830.

Note—On the back of the above Document [marked No. II. (A)] is written, "Nos. 1, 2, 3, and 5, sent home in original."—J. M.

# No. III.

## EXTRACT FROM THE HONORABLE THE COURT OF DIRECTORS' LETTER, DATED THE 10TH NOVEMBER, 1830.

(No. 1.)

Para. 1. We shall now reply to your Secretary's letter dated 16th February, 1830, in which our particular attention is solicited to a Minute of the Governor General, dated 2nd February, 1830.

2. In this Minute the Governor General proposes, that the line of the canal, now executing according to the plans of the late Major Schalch, shall pass to the Westward of the Salt Water Lake, instead of through the Lake, as originally designed, and that the Lake shall be drained and embanked. This would, in his Lordship's judgment, greatly improve both the salubrity of Calcutta, and the navigation from the Hooghly into the Sunderbunds. It would also gain a great quantity of valuable land—but the Lake has been disposed of in perpetuity, paying a rent of about Rs. 4000 per annum to Government.

3. The Minute and its accompanying documents detail the plan and estimate, the cost and returns.

4. The Governor General proposes—

(1.) That the plan should be submitted to Messrs. Telford, and John & George Rennie, for their opinion.

(2.) That if we should be unwilling to undertake the measure, we will permit individuals, including our servants, to embark their money in the work; and,

(3.) That the Company should bear one half of the expense in return for the improved Navigation and the increased Tolls.

The Governor General further states his conviction;

(4.) That "incalculable benefit might be derived from the deputation to India, for "two or three years, of an eminent Civil Engineer, well acquainted with all the improve- "ments of latter years, who should visit our Territories, and report upon the possibility of "calling forth the hidden and dormant resources of our immense Empire, by the skilful ap- "plication of improved science and modern invention."

5. On these proposals we observe—

(1.) The practicability of the plan depends on the correctness of the Data in the documents, especially with reference to the Soil and the Levels. The utmost, an Engineer not on the spot, can say, is, that if the Data be correct, the plan is practicable. No opinion to this effect can be of any value, or involve any responsibility, except as the result of personal observation on the spot.

(2.) The Plan is a gratifying proof of our Governor General's desire to improve the commerce of India, and increase the salubrity of Calcutta and its vicinity; and, so far as we can judge of it, promises much public benefit. We leave it to your discretion to undertake it wholly yourselves, or to permit individuals, including our servants, to embark their money in the work. If you undertake it on account of the Company, you will do well to open a negotiation beforehand for purchasing the Salt-water Lake. You will be careful before undertaking the measure to obtain the most absolute accuracy in respect of the Soil and the Levels.

(3.) If the work be undertaken by private Individuals, it must be undertaken wholly by them on the same conditions on which Major Tolly executed the Nullah which bears his name, that of receiving the entire tolls for a limited number of years.

(True Extract)

FREDERICK JAMES HALLIDAY,
*Secy. to the Government of Bengal.*

REVENUE DEPARTMENT,
*5th September*, 1839.

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## No. IV.

To CAPTAIN YOUNG.
*Secretary Military Board*

MY DEAR SIR,

The Governor General desired me to send you these papers,* and to request that the board will take the subject of them into consideration; and his Lordship suggests that Captain Thomson, now in charge of the Canals, and other persons, capable of affording information on the subject, should be consulted.

[* To wit those marked I. to III. inclusive.—J. M.]

A day will be hereafter fixed for a Meeting to discuss the subject before the Governor General.

Yours sincerely,

*(Signed)* C. MACSWEEN,
[*Private Secretary to Governor General.*]

*2d September*, 1833.

A true copy.

*(Signed)* H. DEBUDE,
*Offy. Secy. Military Board.*

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## No. V.

## [MINUTE BY COLONEL SIR THOMAS ANBURY, C. B.

SUBMITTED BY HIM TO LORD WILLIAM C. BENTINCK, GOVERNOR GENERAL IN, IT IS BELIEVED, DECEMBER, 1833.]

Received from the Chief Engineer's Office—
*2nd March*, 1840.

### *On the Salt-water Lakes, with a Plan for filling them up.*

I have read all the Papers attentively regarding the Salt-water Lakes, as well as the late Capt. Prinsep's replies to the Queries by the Right Honorable the Governor General; and I am thereby confirmed in the opinion that I held many years back, and long before the Entally Canal was formed, of the practicability of reclaiming the upper parts, if not the whole of the Salt-water Lakes, by means of partially bunding and warping, or both combined; and I think that Capt. Prinsep's Survey of the Suburbs of Calcutta, including the Circular Canal, Salt-water Lakes, and Eastern channel, clearly shew the means of filling up or reclaiming the Lakes, or a considerable portion of them, in a very practicable point of view by the method alluded to; and which will be hereafter explained; and one of no very difficult or doubtful accomplishment.

Many parts, there seems to be no question, (and the lower portion especially) are never entirely dry or without some water: but, according to Capt. Prinsep's replies, and what he has laid down in his Maps, there are very considerable portions that are left dry at low water common tides; and still greater portions, no doubt, at low water neap tides in the dry season. These shoals I conceive may be made useful, by proper means, for obtaining and establishing substantial and permanent ground in aid of subsequent operations.

The vicinity of the Lakes would, I imagine, furnish ample supplies of materials for progressing the operations; and, from the present, and natural circumstances of the Lakes, they may be so successfully managed as considerably to contribute to their self-silting; and without very great labour or very expensive artificial means.

A favorable circumstance for operations, is, that the waters of the Lakes (I believe throughout) discharge into the great Eastern channel and principal drain, by small sinuous gutters or channels, which it seems have not any considerable velocity—but rather that the current through them, is tardy, and very languid; and that they rather spill over into the main channel; and this from the slowness of the ebb in the great channel, and the inconsiderable depth of water at the very highest levels of the Lakes: from this, I am induced to think, that they may, without much difficulty, be rendered subservient to the object in view; for, as the upper or northern extremities of the Lakes are filled up, the waters would have less expanse to flow over; and their reflux would consequently become much accelerated and more rapid.

If any dependence is to be placed on Capt. Prinsep's Scale of Levels, which is hardly to be doubted, there does not appear to be any reason to apprehend material obstacles or bar to the practicability of reclaiming the whole of the Lakes, by Draining, Bunding, and

subsequent Warping: the Draining will be naturally gradual, but may be regulated as required by bunding small tracts, and reclaiming ground by degrees; as will be explained hereafter.

It is within my recollection, that what is now the Entally Canal, was, originally, a series of large pools from the Salt-water Lake, to that part of Entally which connects with the Circular Road, (then only a bye and little frequented path of the filthiest description) and known as the Calcutta boundary; and called the Maharatta Ditch. Many years have passed since I was on the Lakes; but their nature and appearance, at the time, is strong in my recollection; and what I then thought might be done to reclaim the land to a state of cultivation. That the Lakes must have (however imperceptibly, or from what cause) shallowed, or filled up in a very considerable degree, their present state, as laid down in Capt. Prinsep's Maps, leaves little reason to doubt; notwithstanding that the water principally flowing into the Lakes is not of a kind likely to hold much alluvion, or earthy matter; yet it may have acquired much of its shoally appearance from the warping from land floods, running, by small channels, into the Lakes, in various directions; and upon this supposition I am induced to think facilities to silting or warping, by like means, are not entirely out of reach; and may be even easily obtained by bringing the loaded or coloured water from the Hooghly into the Lake, by making the Circular Canal the Channel or principal feeder; which, assisted by other means, I am sanguine in the belief, will render the undertaking neither difficult or doubtful.

I am not inclined to consider Capt. Prinsep's observations on Tolly's Nullah as bearing at all on the practicability of my scheme; since, I cannot think, that Tolly's Canal can have any thing to do with the matter of filling up, or draining the Lakes; an operation that must be effected by the great Eastern channel with which Tolly's Nullah forms a junction considerably below the Lakes near Tardah; and in no way affecting them as far as the tides flowing through Tolly's Nullah are concerned; and therefore, in my judgment, cannot, in the smallest way, govern the drainage of the Lakes.

What Capt. Prinsep has advanced, regarding the channel of Tolly's Canal, cannot be of any consequence with reference to the waters of the Lakes;—and the silting near to Russapuglah still less;—which in my humble opinion has nothing whatever to do with the subject: and it may be explained by, or attributed to, the influx from the Sunderbunds meeting the slack current from the Hooghly at the point mentioned, and creating a dead water favorable to a silt, with which the Nullah water, out of the Hooghly, is always abundantly charged; —especially during the freshes—and this I conceive to be the most probable cause of the shoal alluded to by Capt. Prinsep.

But, to return to the Lakes, I am equally of opinion, that the Entally Canal cannot have much, if anything, to do with the object of reclaiming the Lakes; and it is equally immaterial what may be its sediment, with reference to the operations that must be pursued on them, since that part of the Canal must at all times be a back water to where the Lake waters will fall into the Eastern channel; and any increased depth to the Entally Canal would in no way affect the drainage of the Lakes.

What Capt. Prinsep says regarding the sediment of the Lakes, is rather, I am of opinion, favorable to the undertaking than otherwise; he says "it is partial, and chiefly confined to the immediate neighborhood of the channel through it," and this is shewn in his Map; and I think in a great measure goes to prove, that the waters of the Lake do give a silt, however trifling; which by proper means may be increased and secured.

Since the Entally Canal (as it is said) has no great current, whatever matter it deposits, will not be carried into the great Eastern channel, so as to interfere with the drainage from the Lakes, into that channel, at any time, but especially during the neap ebb tides: but if it did, there are means of clearing the channel, and creating a stronger current—besides materially assisting the works on the upper Lake, near its junction with the main Canal, and accelerating the navigation at the same time.

I am inclined to believe that the surrounding land of the Lakes is, to a certain distance towards its shores, principally, if not all, alluvion ; and that the waters of the Lakes have been of a greater extent than they are at present; and I think it more than reasonable to suppose so, from the proximity of the cultivation to the margin of the Lakes, and the shallow depth of water they at present exhibit near to the cultivated ground ; this may also help to support the supposition that a natural silting has taken place however slow or partial ; and that if proper measures are adopted, that silting may be improved with feasibility, and thereby, and by means of warping and bunding, progressively reclaiming the whole of the Lakes ; and for effecting all this, the surrounding country affords abundant means.

Much of the bunds, or margin of the Lakes, whether naturally or artificially (if Mr. Prinsep's Survey and Map is correct) have been recovered from the swamps, and it should appear the latter, (I will not presume to say by stealth ;) but what would induce the belief is, that it is quite to the water's edge under cultivation, as shewn in the Map of 1830; and this has probably been accomplished by small means, and unobservable degrees ; which induces a reasonable conclusion, that when bold and ample means are adopted, the progress, in so desirable a work, will be, in a proportionate ratio to the means used, more increased and efficient:—thus much on the present state of the Lakes, as connected with the Eastern channel.

Previous to entering into the explanation of the means I conceive may be successfully employed for the accomplishment of the work, I beg to premise, that no estimate or any calculations have been made regarding the work; or of the cost and contingencies that may be found requisite ; and must be incurred in the prosecution of the work or undertaking ; nor has any attempt been ventured at contrasting the great possible benefits to be derived by Government, and the public generally, on the successful completion, with the outlay that must be incurred.

The Levels of the Hooghly river and the Salt-water Lakes, comparatively, is hereafter considered,—and a Diagram made (see Plates 1, 2, according to Mr. Prinsep's Scale of Levels) for shewing the practicability of bringing the river water, for silting, into the Lakes : and I have little doubt of the success of this, as an auxiliary, in reclaiming the Lakes, after the channels by which they are naturally crossed and intersected, and by which the water now passes out of them, are stopped and bunded where it appears that they are most shallow or least covered by the medium tides ; and by a bund along the line of the Eastern channel, by which the waters of the Lakes ebb out as the tides fall :—this bund would also afford a towing path, at present much wanted, along the Eastern channel, with proper openings, or self-acting sluices.

If the Surveys, or what has been laid down as the features of the Lakes, are correct,—which however are without any Levels of its natural bed, which I should presume is nearly equable—the first means I would employ, for a complete drainage, would be by bunds ; progressively securing what has been drained, or more properly described, what appears at

present shallow or a partial silting; and the latter I should judge to be the case from Capt. Prinsep's Maps of 1829 and 1830; which shew in the former an entire sheet of water, and in the latter a silting or increased accumulation of soil nearly all round.

It is not to be expected that this drainage can be effected immediately; but it may be done progressively, according to the number of hands and extent of labour employed, in a moderate period. First, then, I would propose the desiccation of the Upper Western or Smallest Lake, by draining into the Eastern channel,* for which, it appears by Capt. Prinsep's Map of 1830, there is abundant facility by means of the contracted space between A, B; which is probably very shallow, and may be easily and speedily bunded (if the depth of water in the upper Lake is accurately given, namely, "never more than 2 feet," the distance being only 3100 feet—see Plan No. 1.): this bund I would propose to be composed of a double hedge of wattles or hurdles, 10 feet apart, and filled in between by the soil of the Lake thrown in from outside the southern hedge of wattles; which may be done by hand at low water; or a dredge, when the water is at its highest even; or materials brought from the terra firma along the spits of land; or silt that would be joined by this bund; and which would allow of the work being prosecuted even while the Lake is flooded: these spits might be at the same time secured by a similar bund—if deemed requisite—and would be consolidated by the passing and repassing of the labourers thereon; and might be carried on with considerable rapidity. The bund should be commenced at B, and crossed to A; but, if dry material can be obtained from the terra firma in the vicinity of Ballia Ghaut or the Entally Canal, I would work on the shoal or spit, from C to A—whereby it would be confirmed, and a strong bund formed—elevated above the highest flood of the Lakes—and would materially facilitate the construction of that from A to B:—and perhaps it would be the best method to work at the same time from D to B—and then join A B. While in operation the tide must be allowed to flow into the Lake (western) until the barrier is completely formed; and then securely closed:—the influx of the water would then be at E and F,—which might also be bunded at the points E, F, or G, when the draining has been completed; and at G might be constructed a small drain sluice, to let off any water, accumulating from rain or ooze, remaining after the tide waters have been let off in inequalities of the bed of the Lake.

The Southern portion may be drained, by the natural channels, into the East division of the Lake, as at U, which may be bunded in the same way, or quite along that bank from T to K, if requisite: a draining sluice might here also be required. Until warping could be commenced on, this operation, for the upper or Western portion of the Lake, may be effected from the waters of the Hooghly, by means of the Circular Canal, and by sluices or dams with vanes or self-acting flood-gates (at 1, 2, 3, 4): the latter would require little attendance, or less than the other modes of letting in the water, and would afford an ample supply of coloured water, giving abundant alluvion or silt, to bring the upper Lake to a level above the highest springs of the Lakes, which are below the level to which the water can be raised in the Circular Canal; and which might be raised, or increased, by means of a Lock at the junction of the Circular with the Entally Canal at H, to any height required; this might also be used as a scourer to the upper part of the Eastern channel.

I imagine that much silt, or alluvion, might be obtained from the water-courses

* It may be also drained into the Eastern Lake, into which lead several natural channels.

K

and drainage from the lands surrounding the upper Lake; and from a channel to the northward, from rain-floods and land waters accumulated on the grounds to the North of the Dum-Dum bridge, and where, according to the Map, a considerable silting or filling up, appears already to have taken place. These waters, when they have yielded their deposit, may be drained off by the small channels E, F, and sluice at G.

I do not contemplate that any diagonal bunds will be found requisite to retain the silt in the upper Lake, or perhaps only in a few places, to preserve the level, or an equality of silting from the Canal or northern drainage.

For wattling this longest and principal bund—abundant material from the surrounding country would be procurable; and likewise for the diagonal bunds in the adjoining Lake:—no great quantity I imagine would be consumed (principally gransticks and brushwood, made into fascines); or would it be long ere the whole of the shallows may be connected, and entirely secured from the influx of the water from the Sunderbunds.

The Upper or Western Lake being secured—the next operation would be to establish a bund on the northern bank of the Eastern channel—or passage through the lower Lakes, from "Chingrahatta" to the drains near the second Choke—to be constructed as described for the Western Lake:—this (the Eastern division) being drained by cross bunds through the channels above the second Choke; and at T they might be bunded up, and the bund continued on to V—affording also a good towing path. This perhaps would be a more serious and laborious undertaking than the work afore detailed; in as much as it must be executed in a greater depth of water, and probably may be exposed to a stronger influx from the Sunderbunds; and the line to be bunded, on the bank of the channel, more extensive: but the small sinuous channels, or drains running diagonally through the Lake, as described in Capt. Prinsep's Memoir, I am led to imagine would greatly facilitate the operation, as it appears, that the water of the Lakes pass off through these at ebb tides, leaving both Lakes almost dry, or at least so near it, as to leave them in a state very favourable for securing or certainly gaining upon the shallow parts; and by degrees, if not immediately, putting them in a state to resist the influx from the Sunderbunds.

The Lakes, being intersected by small and sinuous drains, all leading to the main channel, by being progressively choked or bunded, would be made to deposit whatever alluvion they may hold in their flow into or out of the Lake—keeping open only one or two, to carry off the water while the operation of bunding is in progress—but as the channel is indolent, the more favourable to silting, or not possessing velocity beyond what is barely sufficient for the purposes of navigation, the operations would, I imagine, here be very slow and tedious (I mean in the Lower Lake) and probably not so satisfactory as is contemplated in the upper Lake; yet, by Capt. Prinsep's Memoir, the current, at Bhowni-Ghatta, is represented as wide and rapid at low water, with 15 to 20 feet of depth—this would favour a belief that the channel would be favourable to an equally rapid drainage from the Lakes; but if so sluggish as represented, it may be considered whether a Lock at Ballia Ghatta or Chingrahatta might improve the velocity in the immediate vicinity of the lower Lakes, and by keeping the water within the boundary or course of the Eastern channel, by bunds on each bank, facilitate the drainage on both sides, and give greater force to the current for the purposes of navigation.

Silting of the lower Lakes (the Eastern division in particular) seems to be the most difficult, but, I imagine, not impracticable. If like the northern Lake, [it] must first be drained, and that in the same manner as the West division; and then bunded:—and it

seems, from the extent, that cross bunds will be required to arrest whatever alluvion or silting matter may be washed and conducted from the surrounding lands. In the absence of sufficient data, I am unable to say or to form any opinion as what besides can be done to effect the object in view.

The shortest distance in this Lake to be bunded is 5,000 feet, and the longest distance 8,000 feet, according to the Chart by Captain Prinsep of 1830, without any appearance, or promise of aid from shallows. However the Western portion, by draining through the Eastern, and by being agitated in the operation of bunding from C to D, including A, B, might furnish some silting; and the bunding from K to L would probably furnish a pretty accurate criterion of the possible success on the other lines M, N,—O, P,—K, Q,—R, S; and I think that the agitation caused in the northern bunding would shew what might be expected—the drainage of which would be through the different bunds, and discharged ultimately by the natural channel at S;—and for the lower parts, south of R, S, it would run through one or more channels at T, T, T—what quantity of silt, or whether any would be arrested by means of these bunds, I will not pretend to say, but I should expect, that some would be obtained.

The South portion of the Lake seems to be less difficult, and offers greater facilities than the other divisions—and by no means requiring great labour to reclaim.—In no part is there more than 2,400 feet breadth of water; it is likewise intersected by channels, through which it might be drained; the shoals are considerable and little bunding would be required:—possibly the inhabitants of the vicinity, of this part, might, through proper management, be induced to accomplish it for the sake of the land to be gained, or to exert themselves in affording assistance to such a desirable measure. Of the Eastern Lake, or as it is called in the Chart of 1829* Kalydar-Dhappa, there seems to be fewer obstacles than in either of the others; and, if the topography is correct, much land seems to have been already reclaimed by natural operations; and I am inclined to imagine that a much greater expanse of water has heretofore existed there, [than] that at present, as it is laid down on the maps.

[* Qy. 1830.—J. M.]

The work, I think, should commence on the Western Lake (No. 1) by throwing the bund from A to B, and also working from either side C, D, towards A, B, and draining by the channels E, F;—the bund being completed and secured, the drainage of the lower portion would be effected by the channel U, into the Eastern division;—and this portion being drained, the channels at U, V, must be dammed up, and all minor outlets into the Eastern channels, to secure the part drained from the influx of the tides from the Sunderbunds.

In a similar way must (No. 2) the Eastern division be managed;—but, there not being any record of the Levels or Soundings, at least none appear to have been made or within reach--what difficulties may arise from inequalities of the sole or bottom of the Lakes, it is not possible to say; but if the Data is correct, that in the Western, there is not more than 2 feet water, and in the Eastern 3 feet water at highest flood tides; and at lowest neap tides both are nearly dry:—I should not fear any great difficulties in accomplishing the work, in the simple manner proposed.

The Southern division as before stated, seems even more practicable,—following the same operations, draining by the small channels running through it (and intersecting it) into the Byah Nullah, and then bunding, as found requisite, to keep out the influx of water from the Sunderbunds. In conclusion, I would bund both sides of the Eastern Channel or Canal from Chingrahatta to an extent down the Canal, that would effectually secure the reclaimed ground from inundation, even at the highest tides, and at the same time form a very com-

modious towing path; which is at present very much wanted for boats coming up to the entrance of the Entally and Ballia Ghaut Canal, on an ebb-tide.

From a careful and attentive examination of the Levels on the Scale given by Captain Prinsep, and laying them down, on a Section from the Circular Canal to the Salt-water Lake, and from the Hooghly at Calcutta to the Circular Canal, it does not appear to me that there is any difficulty in bringing the coloured water of the Hooghly to the Western Lake, (No. 1) through the Circular Canal: it is very probable that objections will be started as to the effect these feeders may have on the navigation of the Canal; but I do not at all apprehend any that may not be guarded against or obviated, if found to exist; I would however submit the scheme to the original projector or director of the Canal, for his opinion.

I have given sketches of the sluices or flood-gates that may be employed in the work, but I would court investigation of their efficiency and the feasibility of my plan altogether.

I have not, as I said before, framed any Estimate of the cost or expenses to be incurred, or calculation on the quantity of silt that must be brought into the Lakes, or their sites after they have been drained;—this may perhaps be best done by the party or parties who may be employed upon or intrusted with the management of the operation, should measures be adopted for carrying the plan into effect.

*Colonel, Chief Engineer.*

## No. V. *(continued.)*

APPENDIX.—It is very little more than two miles from the northern part of the Lake to the entrance of the Canal from the River Hooghly; and much about the same distance along the Dum-Dum road, on each side of which there are wide and deep drains running into the channel under the Dum-Dum bridge, which would afford very considerable washings, if connected with the Circular Canal at high tides in the freshes, into the upper parts of the site of the Western Lake—which, when they had deposited their alluvion, would be drained off, by the sluice or outlet at G, with the ebb tides, toward the Eastern channel—the same as the washings and land floods, led towards the upper Lakes, when they had given their deposits.

*(Signed.)* T. ANBURY,
*Colonel, Chief Engineer*

# No. VI.

## *Government of India Proceedings 5th March,* 1835. No. 8.

No. 4614. (Copies.)

FROM THE MILITARY BOARD,

To THE HONORABLE SIR C. T. METCALFE, BART.,

*Vice-President in Council.*

Department of Public Works.

HONORABLE SIR, *Fort William, 7th February,* 1834.

With reference to the accompanying* Documents, relative to the Drainage of the Salt Water Lake, and to the improvement of the Canal, we beg to report the result of the consideration which we have bestowed on the subject.

The Board submit a Report relative to the Drainage of the Salt Water Lake.

2. As a preliminary step, we referred the subject for report to Captains Forbes and Thomson and Mr. Prinsep.—Copies of the Letter to the Committee, and of their Report, together with the Papers connected with it, are submitted for the information of Government.

3. We have taken these Papers into our attentive consideration, and we beg to forward the Minutes recorded by us on the subject, as conveying the individual opinions of the Members.

We have the honor to be, &c.

(*Signed*) T. ANBURY, *Col. Chief Eng.*
,, A. GALLOWAY, *Lieut.-Col.* M M.B.
,, D. M'FARLAN, *Chief Mag.* M.M.B.
,, J CRAIGIE, M.M.B.

# No. VI. (A.)

## *Government of India Proceedings 5th March,* 1835. No. 9.

No. 2378

FROM THE SECRETARY MILITARY BOARD,

To THE COMMITTEE. [To wit, Capt. Forbes, Capt. Thomson and Mr. Prinsep.]

GENTLEMEN, *Fort William, 27th September,* 1833.

I am directed by the Military Board to transmit to you the accompanying Papers, (13 in number) on the subject of Draining the Salt Water Lake, and to request you will form yourselves into a Committee, and report your opinion on the following points:—

*First.*—As to to the expediency of undertaking the work, with reference to its probable influence on the health of Calcutta, and to the return which may be expected for the outlay; on the latter point, information may be obtained from the Revenue Authorities, and from Mr. Dampier, Commissioner in the Sunderbunds.

*Second.*—On the best mode of executing the work.

*Third.*—On the expense, and length of time that would be required for its completion.

*Lastly.*—On the effect it would have on the Drainage of Calcutta—proposing such means for obviating any difficulties, in this respect, as may occur to your Committee.

[* To wit, those marked I to III, inclusive.—J. M.]

# No. VI. (B.)

## *Government of India Proceedings 5th March,* 1835. No.

FROM THE COMMITTEE, [To wit, the above Committee]

TO CAPTAIN G. YOUNG,

*Secretary to the Military Board.*

SIR, *Calcutta, 11th January,* 1834.

Having, as directed by your letter dated 27th September, formed ourselves into a Committee for the consideration of the questions proposed by the Military Board, respecting the Drainage of the Salt Water Lake, we under the heads stated in the margin, have the honor of submitting the conclusion, which the investigation of the subject we have had it in our power to make, appears to authorize.

*Q* 1. As to the expediency of undertaking the work with reference to its probable influence on the health of Calcutta?

*A*. Fortified by the opinions of Medical men, we have reason to believe that entirely embanking out salt and brackish water, and effectually draining off rain and alluvion-charged river water from a surface of forty square miles, a great part of which is now daily overflowed and receded from by the tide, an area included in and surrounding the Salt Water Lakes, and lying to the South-eastward (and for Nine months of the year to Windward) of Calcutta, will most materially improve its salubrity, and that of the country adjacent. The embankments adapted for effecting this object, and aided by means of drainage, also serving to reclaim, for cultivation, the greater portion of the above area, would run, as represented in the accompanying sketch, transversely nearly in the direction D C B F G, and along both sides of the Canal, as it passes through the Lake A B E F The space, colored blue in the sketch, marks the extent of surface protected from the source of insalubrity alluded to, and rendered susceptible of cultivation

*Q*. 2. What return might be expected when the Lake was drained as far as practicable?

*A*. Although it would be difficult to appreciate the improvement thus rendered to the healthiness of the Capital, or accurately to estimate the value of the reclaimed land, the annexed Statements, of the Executive Officer, incline us to believe that the attainment of the important objects contemplated, may be effected with a return of 10 per cent on the outlay

*Q*. 3. The best mode of executing the work?

*A*. By embanking out the salt water, as above described, and by providing sluices for the discharge, at ebb tide, of rain water or of alluvion-charged water, admitted by the Canal and by a feeder, joining the Hooghly and the upper end of the Lake, for the purposes of irrigation, of ameliorating the soil, and of raising the level of the bed of the Lakes by warping.

*Q*. 4. What would be the expense?

*A*. Exclusive of the purchase of land, the subjoined Estimate, prepared by Captain Thomson, induces us to conclude that the probable expense of the requisite works, exclusive of a Feeder, (separately estimated for) will be Sicca Rupees 200,000.

*Q.* 5. Length of time that would be required for its completion?

*A.* The embankments between the nullahs may be immediately commenced; and when the requisite information has been procured, lands purchased, and materials collected, which probably cannot be accomplished in less than three years, the completion of the embankments, the construction of a new feeder, of drains, dams, and sluices, may be completed in two years more, or totally in five years from the time the entire work was sanctioned.

*Q.* 6. Probable effect on the Drainage of Calcutta.

*A.* The Drainage of that part of Calcutta, lying to the Northward of the Durrumtollah, would not in any way be affected by the works proposed; and the drainage of the ground, situated to the Southward of this street, might be much improved by them, as they would afford it an increased fall of from two to three feet.

(True Copies)

(*Signed*) G. YOUNG,

*Secretary Military Board.*

## No. VI. (B 1)

### *Description of the Ground lying South-eastward from Calcutta.*—11*th January*, 1834.

The general Level of the East bank of the Hoogley, at and near Calcutta, where not artificially raised, is about + 13 or + 14 of Captain Prinsep's gauge. The ground slopes inland from 2 to 4 feet in a mile until it meets the general Level of the country, which varies from + 8 to + 1, the average Level of the cultivation being about + 3. These facts are known principally from Levels taken at Calcutta, and between Tolly's Nullah and Diamond Harbour, by the late Major Schalch.

There have been no instrumental Levels taken between Calcutta and the ground at Bhamunghatta or Tarda: but the general Level of the country, with reference to the rise and fall of the tides in the channels which run through it, is known within one foot—which is the knowledge of most importance in the present inquiry.

That part of the country, between Bhamunghatta and Tarda, which is the out-fall of the Lakes, and which is covered with jungle, is 1 feet 6 inches under water, in high tides, during the rainy season, and about 6 inches above the highest rise of the tides in the dry weather. These Levels refer to the banks of the channels of the Tarda Nullahs; the interior of the jungle is supposed to be 1 foot lower.

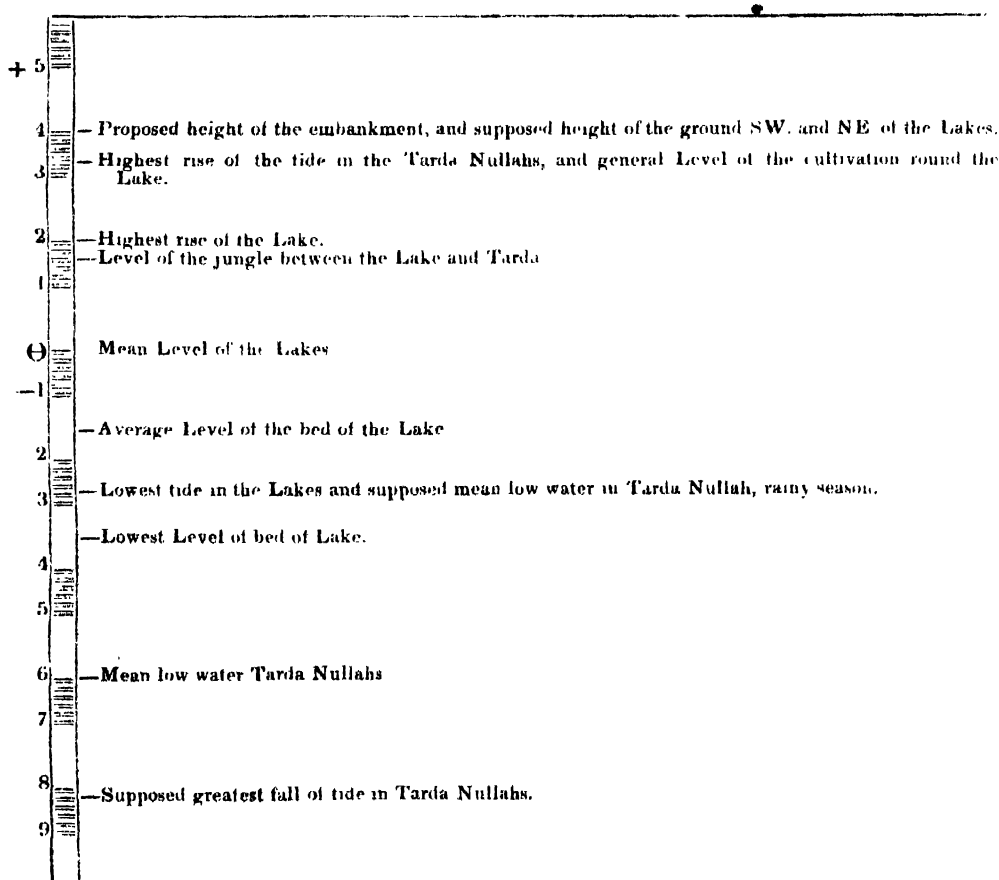
The lowest fall of the tide below the banks of these channels is 10 feet; the mean low water for 8 months in the year, about 7 feet 9 inches; at which time the mean lift of the tide is about 6 feet, or 1 foot 9 inches below the banks. It is supposed that this mean high water in the dry weather is about the Zero of Captain Prinsep's gauge—but the correctness or otherwise of this supposition is not of much importance to the practicability of Draining the Lake.

## BHAMUNGHATTA GAUGE.

| | feet | inches | | |
|---|---|---|---|---|
| Ground near Bhamunghatta. ... ... ... ... ... ... ... ... ... ... ... | 9 | 3 | | |
| Level of jungle. ... ... ... ... ... ... ... ... ... ... ... ... | 8 | 9 | | |
| Mean height of tide in dry weather (or Zero). ... ... ... ... | 7 | 0 | 6 | 0 |
| Mean fall of ditto in ditto. ... ... ... ... ... ... ... ... | 1 | 0 | | |
| Greatest rise in rains. ... ... ... ... ... ... ... ... ... ... ... | 10 | 3 | 11 | 6 |
| Ditto, fall in dry weather. ... .. ... ... ... ... ... ... ... | 1 | 3 | | |

The Level of the Ground to the North of Tolly's Nullah and South-west from the Lake, is rather high, being perhaps + 4. The ground also about Govnamagee and Chuttabarya is about the same Level; and there is a piece of ground, perhaps equally high, running between the North-east side of the Lakes and the Doodbeebee khaul. It is worthy of remark, that this khaul is dammed up between Govnamagee and Tarda, and that it generally flows South, and ebbs North, notwithstanding its communications with the Tarda Nullahs by means of the Bhogdiggee Canal. There is little difficulty in accounting for this anomaly and for the Bhamunghatta Canal ebbing Eastward, by the influence of the Lakes requiring a longer time to run out, and consequently retaining the Tarda Nullahs on a higher Level than those to the Eastward, which are not so influenced. The soil of the country with which the embankments will be formed, is rather favourable to that purpose—being a very stiff black clay, impervious to water while it remains moist; which moisture may be retained by encouraging vegetation on the surface.

### LEVELS REFERRED TO IN THE FOREGOING DESCRIPTION.




J. THOMSON, *Captain*,
*Superintendent of Canals.*

# No. VI. (B 2.)

## *Rough Estimate of the probable expense of Draining the Salt Water Lakes, agreeably to the Plan recommended in the foregoing Report.*

*Calcutta*, 11*th January*, 1834.

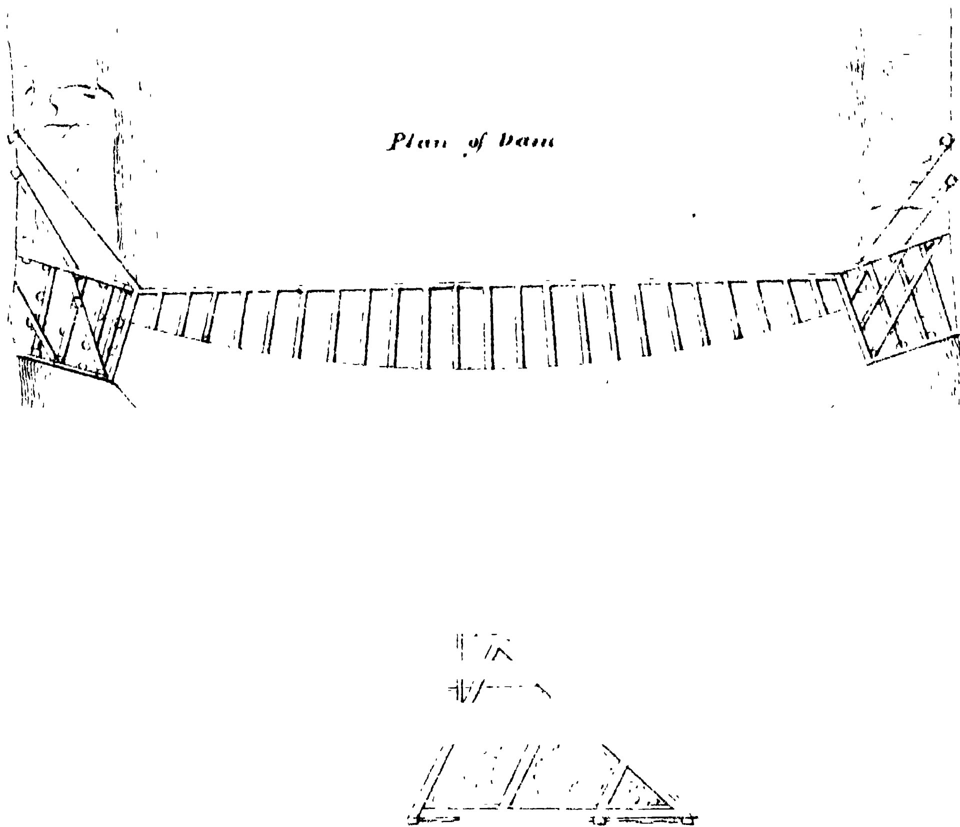
SECTION OF EMBANKMENT.

The Embankment is proposed to be 4 feet high with a base of 24 feet; the general Level of the ground on which it will have to be raised, is about Zero,—requiring a section of 56 sq. feet.

The total length of Embankment is 25,000 yards, inclusive of the banks of the Bhamunghatta and Bhogdiggie Canals, which will require very little work to convert them into sufficient embankments. An Embankment of this section may be executed for 80 Rs. the 100 running yards, including the damming up of all Nullahs not exceeding 6 feet in depth, and raising the ground, now under water, by bringing the earth from an average distance of 2 miles—25,000 yards at 80 Rs. per 100 yards=20,000 Rs. Embanking 20,000 Rs.

There are 4 large Nullahs to be dammed up, and about 30 smaller ones, the most formidable of which is the Byah Nullah; this, at its outlet from the Lake, is 100 feet wide, 20 feet deep at high water, and 14 feet at low water, and the greatest difference of Level to be expected between the water on each side of the dam, being 10 feet, the pressure to be sustained by it will be about 200 tons. Two modes of damming up the Byah Nullah have been suggested:—one by means of piling—the cost of which is estimated at 20,000 Rs.; the work being difficult of [execution]* excavation, and requiring much time and attention,—on this plan the damming the 4 Nullahs would cost 70,000 Rs:—the other by means of a wooden frame, constructed at any convenient place, and floated to that part of the Nullah proposed to be dammed, where it would be sunk by means of earth, and retained in its place by abutments, formed of piles, and by cables attached to stakes on the banks; the current being stopped by this means an earthen bund could be carried across, after which the wooden dam may be floated to another Nullah for the same purpose.

Sic in Original. J. M




## ESTIMATE FOR WOODEN DAM.

| | | |
|---|---|---|
| 25 Frames @ 200 Rs. each. ... ... ... ... ... | 5,000 | |
| 900 Running feet of beams and struts (12 × 12) @ 2. ... ... | 1,800 | |
| 3200 sq. feet of planking 3 in. @ 1. ... ... ... ... | 3,200 | |
| 2 Tons of Iron bolts @ 500. ... ... ... ... ... | 1,000 | |
| ... ... ... ... | | 11,000 |
| *Draining one Nullah* | | |
| 250 Feet of piles 10 Dr. @ 4 Rs. per foot ... ... ... | 1,000 | |
| 150 Feet of string pieces @ 2. ... ... ... ... ... | 300 | |
| 100 Tons of ballast @ 4. ... ... ... ... ... ... | 400 | |
| Fixing dam by cables. ... ... ... ... ... ... | 400 | |
| 1,50,000 cubic feet in earthen bund. .. ... ... ... | 300 | |
| Contingencies. ... ... ... ... ... ... ... | 600 | |
| | 3,000 | |
| 3 more Nullahs. ... ... ... ... ... ... ... | 9,000 | |
| 30 Smaller Nullahs @ 300 Rs. ... ... ... ... ... | 9,000 | |
| | | 21,000 |
| Total expenses of making Dams. ... ... ... | | 32,000 |

Damming Nullahs 32,000.

It may be remarked, that the Nullahs proposed to be dammed, could not be embanked in the manner that the Lake Channel can, because they issue from the deepest part of the Lakes and have no defined banks.

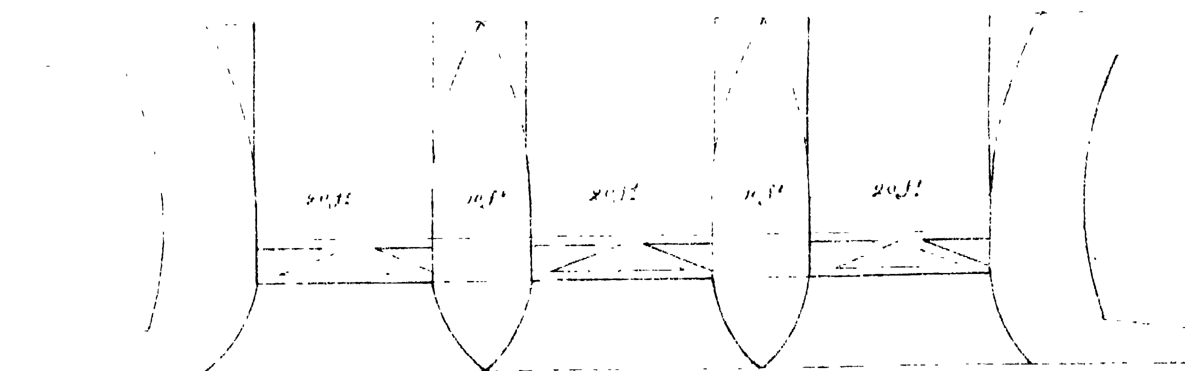
*Draining Sluices.*

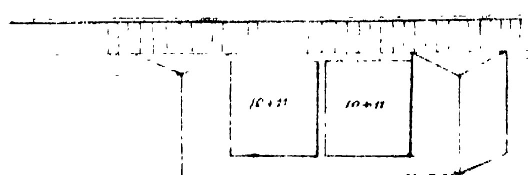
The number of Sluices considered necessary to drain off a fall of 3 inches of rain in the 24 hours from a surface of 40 sq. miles, is 16 (each 20 × 10); they are proposed to be situated as follows :—5 in the vicinity of the Byah Nullah ; 7 near Bhaminghatta ; and 4 near the Kantatullah khaul. The description of sluice estimated for, is the self-acting sluice in general use, with two gates on vertical hinges. But the details will require much consideration before the plan is finally determined on. It is proposed to lay the sill of the sluice at 8 of Captain Prinsep's gauge.

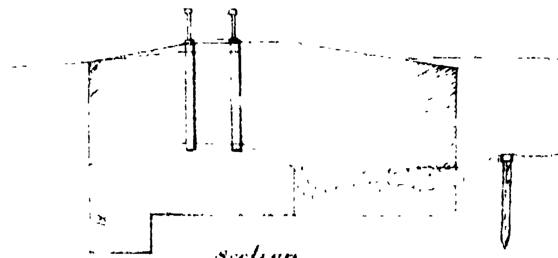
*Estimate for a Sluice with 3 openings.*

| | | |
|---|---|---|
| The brickwork contains 50,000 cubic feet, which, including excavating and draining, may be done for 16 Rs. ... ... ... ... ... | | 8,000 |
| 350 Cubic feet of teak framing @ 3 Rs. ... ... ... ... | | 1,050 |
| 600 sq. feet of sluice gates not coppered | @ 3/8 ... ... ... | 2,100 |
| 600 sq. feet of sheet piling ... ... | @ 3/8 ... ... ... | 2,100 |
| 200 tons of ballast. ... ... ... | @ 4/0 ... ... ... | 800 |
| Contingencies. ... ... ... ... ... ... ... | | 950 |
| | Total, ... | 15,000 |

*Plan of Sluices*



Draining Sluices 82,000.

| | | |
|---|---|---|
| The 5 sluices on the Byah Nullah. | ... ... ... ... ... | 26,000 |
| 7 near Bhaminghatta. | ... ... ... ... ... | 36,000 |
| 4 near Koantatulla khaul. | ... ... ... ... ... ... | 20,000 |
| | Total, ... | 82,000 |

The Feeder proposed to bring water from the River Hoogley to the Northern end of the Lake is supposed to be of the size and description estimated for by the late Captain Prinsep, and will probably cost,

| | | |
|---|---|---|
| Cutting Canal. | ... ... ... ... ... ... ... ... ... ... | 23,000 |
| 4 Bridges or tunnels with sluices at one of them. | ... ... ... | 40,000 |
| Contingencies. | ... ... ... .. ... ... ... ... ... | 7,000 |
| | | 70,000 |
| Purchased land about 800 beegahs. | ... ... ... | 4,00,000 |
| | | 4,70,000 |

## No. VI. (c.)

## [MINUTES OF THE MILITARY BOARD.]

*Government of India, Proceedings 5th March*, 1835. No. 10.

SALT WATER LAKE.—DRAINING AND WARPING.

Minute by Lieut. Col. Galloway

The scheme presented by the Committee is chiefly confined, save the Feeder, to the process of *draining* the Lake, not of warping. But, I apprehend, the warping will be found indispensable, both in regard to the advantage proposed as to increased salubrity of climate, and for the purpose of cultivation. For, supposing the embankments, projected by the Committee, to be formed, with their sluices all in operation, is it imagined that the surface of the bed of this extensive Lake, throughout the interior of its area, is so even, and that its general level affords such a slope towards those embankments and sluices, that you have only to open these, and the water will drain off as from the glacis of Fort William. No! it will be found that the bottom of these Lakes (for there are three almost distinct ones) is greatly unequal in depth; that your drains through these embankments would not reach the interior cavities; and that after your draining off the water, as proposed,—all the water that would thus come off,—you would leave the surface in a predicament infinitely more noxious than it ever is in now, in regard to the production of malaria; that is, it would be studded with pools of stagnant and dead salt water, instead of being, as now, a whole surface of living brine. And consequently that a great portion of the area would thus be quite unfit for cultivation; and could not be made use of without an expense, which would most likely absorb all the profits contemplated by this Committee. My opinion, therefore, is,

that the process of *warping* should at the first be commenced:——if this succeeded, there would be no necessity whatever for draining, as a separate and preliminary measure—for, as the bottom became elevated, the water would naturally recede——and, in order to do this, I apprehend all that is necessary, is to cut a feeder, as projected, from the Hoogly, near Cossypoor, for the purpose of admitting the water, and simultaneously forming warping bunds. But I would by no means recommend that the warping of the whole Lake be attempted at once; the agitation, by the wind, of the water on so large a surface, would impede the deposit of silt. I would therefore, and for many other reasons, commence by throwing an embankment across, between the first and second divisions of the Lake, see from *A* on the sketch, at Balliaghatta on the south, to *H*, at the village of Jarool on the north of the Lake.—This embankment should be used as a *weir-dam*, of a height sufficient to retain the feeder water, charged with deposit, until the precipitation of the deposit had taken place: after which it would, were the height of the dam duly proportioned, suffer the clear water to flow over the embankment. If this were found difficult, on account of the washing down of the earth,—then the embankment must be raised above the level of the water, and the necessary outlets could be adjusted by means of top sluices, with overfalls of coarse wooden blocks; as a temporary structure only would be requisite.

2. The distance between Balliaghatta and Jarool, on the sketch, appears to be about 5000 yards; and, according to Captain Thomson's estimate, an embankment of four feet in height, four feet at top, and twenty-four feet bottom, would cost, even if the earth had to be carried two miles, about 80 Rs. per 100 yards in length; consequently for 5000 yards, 4000 rupees only would be required; but this embankment would hardly need to be so high, for the greater part of its course.

4
8
12

| | | |
|---|---|---|
| Supposing however the cost of embankments to be ... ... ... ... | Rs. | 4,000 |
| Add the estimate for excavating the feeder, which Captain Prinsep reckons at per mile Rupees 7,680, the section being equal to discharge, at 6 feet deep, a section of water of 200 square feet; the length, about 3 miles, amounts to ... ... ... ... .. ... ... | *Rs. | 23,640 |
| For three bridges, with a sluice at one, .. ... ... ... ... | | 45,000 |
| The total cost would be ... ... ... ... ... | Sa. Rs. | 72,640 |

[*Sic. in original. —J. M.]

3. No account is here taken of the cost of purchasing ground for the feeder, because that is utterly unknown. But, exclusively of ground here, we should have, for a comparatively small sum the commencement of the process secured, and a very principal item of expence, namely, the feeder canal, defrayed. If successful, we should reclaim no less than 10,640 beegahs of the most valuable portion of the Lake, because it is nearest the Town: this, if reclaimed by warping, would be immediately fit for cultivation. It would be rich soil, and very valuable; and would do far more than defray the expence; and after this, further progress would be easy and certain—no time would be lost, no expence incurred that would not be turned to account. The second division of the Lake, containing about 12,000 beegahs, could hereafter be warped in the same way, and by means of the same feeder, merely by raising the banks of it as it passed through the portion already warped up, and throwing an embankment across by Baminghatta and Hatgatcha, which would cost about 4000 more. Thus we should proceed I think, with greater satisfaction and with a better hope of ultimate success. Draining, as a preparatory process, is unnecessary, for if

we have a fall from the Hoogly sufficient to bring in water, charged with deposit, that water will, of itself, expel the salt water, and fill up its place with deposit—when the water will of course recede; and the great advantage of warping, in such cases, is, that it equalizes the level of the bottom. Where the greatest depth is, there will there be the greatest quantity of charged-water, and consequently of deposit brought—whilst it leaves the finest soil fit for immediate cultivation.

4. But we must not suppose that the above is the only expence that will attend warping. To be effectively done, much management will be required to convey the alluvion charged water from the feeder, after it enters into the Lake, in branch or lateral directions so as to spread, as much as possible, over the surface; yet it is impossible to suppose, but that so large a body of water, as that admitted by such a feeder, charged, as it will be, with deposit, forced here to stagnate, and consequently to drop its deposit, can fail to produce the desired effect with proper management, and I do not anticipate that this management will cost any inordinate sum—but it is unnecessary to enlarge upon this part of the work.

5. The Eastern portion of the Lake, or that which in some of the maps is called "Kaleedar Dappa," I do not think we ought at present to take into consideration. It is probably deep in many places, and would be difficult to drain; and it could not be warped from the Hoogly, because it is too far off, and upon the same level, so that no current, capable of carrying deposits, could be thrown upon it. I would therefore suffer it, for the present at least, to remain to perform, what the whole now does, a waste reservoir for the strong and high tides of the Tarda creek; an use which will be found highly valuable with reference to the Drainage of Calcutta. I would therefore omit the Kaleedar Dappa. But that portion of the Lake which lies on the South side of the present Canal is valuable, and to that I will now solicit attention.

6 I entirely concur in the view taken by the Governor General in regard to the Circular new Canal, which passing towards the Sunderbuns should never have entered the Lake. I have long ago stated* my objections to this part of that scheme; and need therefore not repeat them. But, as observed by his Lordship, if the Canal shall be carried outside of the Lake, through firm ground, not only would a footing be obtained on both sides for tracking; but—were the banks of the Circular Canal capable of resisting the current from the river, and the drainage of the Town properly managed, there would be no necessity whatever for any locks—the entire passage might be left free, as in Tolly's nullah. In this case however, with reference to the drainage of the Town, advertence must be had to the fact, undoubted,—that the tide will rise higher within the confined channel of the Canal, than when the water is suffered to expend its force into the broad expanse of the Lake. But, as this applies equally to the proposition by the Committee for confining the Canal by double embankments through the Lake, more need not be said on the subject here.

* [In Minute dated 25th Jan. 1831.—J. M.]

7. The drainage of the Town provided for, every thing is in favor of carrying the Canal outside the Lake. At present no less than six miles of the Canal, to the Eastward of Ballaghatta, passes through the Lake, and is intercepted from all communication with the land; and even were it closed in by means of double embankments, as proposed by this Committee, which appears to me objectionable, and would be very expensive, it would still remain so intercepted until the Southern division of the Lake shall be warped up. Whereas by now bringing the Canal along the Southern border of the Lake, as proposed by the Governor General, it will immediately become open to the whole of that densely peopled portion of the Suburbs of Calcutta, lying to the Eastward of Chowringhee and to the North and East

of Ballygunge—affording, all along its banks, ghats of communication through a space of 8 miles. The line on which this new cut would be made, would commence somewhere near *E* on the Committee's sketch, and pass on to the village of Kerkee, and thence round the South-eastern extremity of the Lake, by Keder and Gwalgoonda to the Tarda nullah. The increase of distance would be, by this route, about 1½ miles, the extent of Canal to be cut, would thus be about eight miles. And to meet this outlay, there would be saved about 19 miles of embankments, viz. the double embankments through the Lake on each side of the Canal,

| | | |
|---|---|---|
| —a very expensive work, ... ... ... ... ... ... | miles, | 12 |
| Ditto from *G* to *D* per sketch ... ... ... ... | | 7 |
| Total miles, | | 19 |

whilst the Canal embankment, surrounding the southern division of the Lake and uniting with the embankment proposed by me from Baminghatta to Hatgatcha, the whole of the Lake would at once be cut off from the Sunderbuns and all their tide ways, and could then be dealt with, as to warping and draining, as might be deemed proper.

8. The advantages, in my opinion, which would necessarily result from the adoption of his Lordship's proposition for carrying the Circular Canal on through the firm ground along the Southern verge of the Lake may be stated briefly as follows :—

Firstly,—Provided the drainage of Calcutta can be managed (and the same difficulty, whatever it may be, exists by the Committee's scheme) and that the current from the river in the rains shall not be found too strong for the banks of the Circular Canal, it would remove the necessity for locks altogether.

Secondly,—It would give to the whole suburbs of Calcutta water communication, by admitting of free access, by land, to the banks of the Canal, which is now and by the Committee's scheme, cut off by its passing through the Lake.

Thirdly,—It would secure a current through the Canal, which, falling into an open Lake, now it never can fully have, by which means it would keep itself open—save perhaps at the spot where the Tarda nullah tide would meet that from the Hoogly, and that could, by dredging, be easily kept free.

Fourthly,—It would save entirely all our other present Lock and Canal establishments.

Fifthly,—It would, with reference either to draining or warping of the Salt Water Lake, render superfluous about 19 miles of embankments proposed by this Committee, besides many sluices to be constructed and nullahs proposed to be bunded up.

Sixthly,—It would give us additional means of warping up the Lake by opening sluices from the Canal.

Seventhly,—The Canal might be made highly useful, by means of such sluices, in relieving the drainage of Calcutta, should the tides and freshes in the Hoogly raise the water inconveniently high in the Canal, by affording overfalls for the superabundant water. It is by such means I would propose, in case of necessity, to regulate the drainage of the Town.

Eighthly,—By excluding, for the present, the Eastern portion of the Lake, or Kaleedar Dappa, the strong tides of the Tarda nullah would yet have a large reservoir left to empty themselves in; and thus the drainage of the Town would still continue to be relieved as at present, though not in the same degree.

Ninthly,—The Canal, if cut round the border of the Lake, would enable us by means of its own embankment, embracing the Southern Division of the Lake, and joining on to the

south end of the Hatgatcha bund at Baminghatta, to cut off from the Sunderbuns, and all their tide ways, the whole of the Lake, excepting the Kaleedar Dappa adjoining—and which indeed may be considered as a part of the Sunderbuns. The extent of surface thus to be included within the embankment being estimated as follows :—

| | |
|---|---|
| 1st Western Division beegahs ... ... ... .. | 10,640 |
| 2nd Eastern Ditto, ditto, about .. ... ... ... | 13,440 |
| 3rd Southern Ditto, ditto, ... ... ... ... ... | 12,000 |
| Total beegahs | 36,080 |

The [annexed] following sketch will shew more clearly the plan I would submit for consideration.

9. If the foregoing propositions should be adopted, the work of the feeder cut, and also that of the Canal, round the South side of the Lake, may be immediately commenced. In opening a communication between the River however, and the Lake, where, in the space of not quite three miles, there will be in the rains a difference of level of about 12 feet between the surface of the Hoogly, and that of the Lake, the necessary precautions must be taken, by means of a sluice or by a constricted channel, to regulate the influx of water. This is provided for, I observe, in Captain Thomson's estimate.

10. The question of right of property in the Salt Water Lake, this Board is not called upon to discuss; I may observe however, that a Lake of so great expanse, lying *within* the domains of no individual, must be considered as one of those extensive Wastes which never have been specially assessed, and must therefore ever remain at the disposal of Government until it shall be so assessed and disposed of—in like manner as the Sunderbun lands are. I know not indeed why this Lake should not be considered as Sunderbun Waste. There is no boundary, on its Eastern shore, to separate it from and define the limits of the Sunderbuns, half so well marked as its own Western margin. Its water is salt—and thus, and in other respects, it corresponds, in every physical property, with those jungles ; and this must in 1793 have been still more obvious.

(*Signed*) A. GALLOWAY.

True Copy,

(*Signed*) G. YOUNG,

*Secretary Military Board.*

## No. VI. (D.)

### *Government of India, Proceedings 5th March* 1835. No. 11.

Minute by Chief Engineer.

I regret, that considering the high authorities under which the report has been framed, I derive no light therefrom, and am rather disappointed. As to the question of "the expediency of undertaking the work with reference to its probable influence on the health of Calcutta," I believe the Committee have arrived at a conclusion which has been reached long since, by a great number, if not all, the medical authorities acquainted with Calcutta and the Salt Lakes in its vicinity; a point I do not feel myself competent to enter upon; however, as the draining, desiccation, or reclaiming of the Lakes, is a measure, independent of the healthiness of Calcutta, much to be encouraged, I should be glad to see the means for progressing the work carried into effect. I agree with the Committee that the mode to be

adopted for effecting this object will be embankments; but I do not exactly agree with them in the mode of application, at least if the Surveys and Plans (the latest by the late Captain T. Prinsep of Engineers) are correct,—for I am decidedly of opinion the end would be most efficiently and effectually accomplished by a gradual acquisition of soil, rather than by exposing a very considerable line of bund or embankment, in the first instance, to a heavy influx, which must besides endure a considerable force from the reflux, before a permanent bund, or a bund the whole length required, could be substantially (or of any great power of resistance) constructed. A gradual acquirement of *terra firma* would have another advantage, and that of no small consequence, I should imagine, that of bringing the ground, reclaimed, into almost immediate cultivation, and comparative salubrity. I agree with the Committee that both sides of the Eastern Canal, as far as it runs through the Lakes, must be bunded; and on both sides crossing all the sinuous outlets from the main area of the Lake—leaving, however, out-drains at intervals, until the bund or embankment is so far accomplished as to warrant the general line being committed to its own strength for the resistance of the floods of tide and back waters. A plan for this I have already submitted* to the Governor General.

* [ Vide Paper marked No. V.-- J. M.]

2 From native information I have obtained on the subject, I am inclined to believe that the advantages likely to be derived, in a revenue point of view, would be more considerable, than is, by the executive Engineer, calculated in his Statement.

3 The best mode, I am quite satisfied, of excluding the Salt Water from the Sunderbunds, is, by bunding in the first instance with temporary sluices or outlets for the water at ebb-tides, while the work is in progress,—and these to be stopped up and secured as the bund proceeds: the "alluvion charged water," will be let off, after it has afforded a silt, by one or two permanent self-acting sluices, as explained in plan. But before a feeder is employed, according to my judgment, the Lakes should be said to be drained or reclaimed, and *then* a feeder, as laid down in both our plans, may be put in operation for warping, assisted by catch water drains where they can be advantageously made along and from the high grounds bounding the Lake to the *Eastward*; and it appears to me that natural operations have already gradually and almost imperceptibly much reduced the extent of all the Lakes, if, as I said before, the Surveys and Plans are at all entitled to the character of accuracy.

4. I cannot pretend to say any thing regarding the Estimate; but from consideration, and looking over the several items of the Estimate, I should say that many things therein are not essential, and some considerably above what the requisite work might be done for.

5. The embankments between the nullahs (as I am inclined to understand the Committee, the spaces between the sinuous outlets at present letting off the ebb into the main channel) might certainly be commenced on, almost immediately, on each side the channel through the Lake, but I imagine *not* without materials being forthwith collected; though I do not thoroughly understand the meaning of the Committee as to the information to be procured and materials collected; requiring an accomplishment of not less than three years, and "the completion of the embankment, the construction of a *new feeder*, of drains, dams, and sluices may be completed in two years more: or totally, in five years from the time the work *was* sanctioned," this I think requires explanation, at least as far as my comprehension serves me.

6. On the drainage of Calcutta, as referrible to the filling up or reclaiming the Lakes, I conceive it has nothing to do, since the Canal runs between the Town and the Western extremity of the Lake,—but, on that head, I should say that a new grand *tunnel* or *trunk drain* should be constructed to carry off all the drainage of Calcutta towards Tolly's Canal: but that is quite another question.

Thus much on the Committee's Report.—

On all the ground South-East of Calcutta, there is not I think much to be said. If the North-Eastern and Eastern Lake were completely reclaimed, little difficulty would I imagine be incurred with the South-Eastern part, or that called Byah Tollah. The variations of the tides, according to Captain Thomson's description (No. 1), I have no reason to doubt, and they present nothing objectionable to the question; the ground about Tolly's Nullah, or the Nullah itself, has little to do with the operation of draining the Lakes. The black clay alluded to (the most fortunate matter possible) to be [used] in the bunds, I would not form* as projected; but by means of strong wattling; if afterwards slopes might be deemed requisite, they might be added: my plans† with the Governor General will explain all that.—Regarding the very expensive dams, they are in my humble opinion quite and totally unnecessary, and the means used in damming up much larger channels than the Byah Nullah may be adopted, and I have no doubt with success; and 20,000 rupees be appropriable to other parts of the grand work. I do not understand Captain Thomson's other scheme of "excavation"—and his plan of the dam requires also explanation. The draining scheme I do not acquiesce in—and it is a vastly heavy item; and in my opinion quite unnecessary. The number of draining sluices I consider as not requisite. More than two or three at most will hardly be required; and the plan of the sluices are inordinately costly—considering that they will be merely temporary, and that when the Lakes are reclaimed they will no longer be required. On the whole, I think that the cost of the undertaking has been heedlessly estimated for; and in fact the plan, if it can be called one, altogether undigested and not at all explained.

* Sic in Original. J M

† Vide paper marked No. V.—J. M.

(*Signed*) T. ANBURY.

## No. VI. (E.)

### *Government of India, Proceedings 5th March,* 1835. No. 11.

Minute by Lt.-Col. Craigie.

The Report of the Committee on the draining and filling up the Salt Water Lakes, is marked by simplicity of plan, and brevity of exposition. It is the joint report of three Engineers of high scientific attainments, and with intimate knowledge of the Lake. It is the result of long consideration, and personal observation of the data on which it is founded. One of the officers (Captain Thomson,) from the appointment which he now holds, may be considered the Engineer likely to be employed in the execution of the work, should it be sanctioned, and therefore willing to be responsible for the success of the plan. A report framed under such circumstances must be entitled to great weight; and it would be impossible, perhaps, to obtain, here, a report that would possess so many recommendations. It is very seldom that three Engineers, of such high attainments, can be found to concur in one plan for the execution of a work of such magnitude and uncertainty:—of the intrinsic character of the report, I shall not venture to speak. I would, however, suggest that the report should be published, and the plan thus thrown open to public discussion and consideration. I conclude that no plan will be adopted that shall not find an Engineer officer, of science, willing to undertake its execution, and to be responsible for its success. It would be a dangerous thing in a work of this kind to prescribe a plan to an Engineer, who would execute it under the conviction that it would fail.

(*Signed*) JOHN CRAIGIE.

# No. VI. (F.)

## *Government of India, Proceedings 5th March,* 1835. No. 11.

I regret that other calls on my time prevent me giving to this highly interesting subject the study which is absolutely necessary to a thorough understanding of it. Nevertheless, I feel that it has peculiar claims upon my attention as Chief Magistrate of the Town; and that I should not be justified in allowing the papers to pass me without an expression of my views on the subject. Minute by Chief Magistrate.

The main object of Government in executing this work, viz. the Drainage and Warping up of the Salt Water Lake, is to improve the salubrity of the Capital. This is an object which is of course of chief importance to the inhabitants of the Town. And I look upon it as absolutely necessary that the scheme itself, and the manner of its proposed execution, should be thoroughly unfolded to the inhabitants. It is quite possible that increased sources of malaria may arise while the work is in progress, and in the event of its being generally judged to have caused additional sickness, it would be satisfactory to Government to reflect, that the public had not been taken by surprise. It is quite possible, that an extended rice marsh, into which, it is probable that the Salt Lake would, in time, be converted, might not be less productive of noxious vapour than the surface of a Salt Lake; and I think every opportunity should be afforded for the thorough discussion of these questions by the parties most deeply interested, viz. the permanent inhabitants of Calcutta.

Supposing the desirableness of the plan to be gainsayed in no quarter, which I shall rejoice to find the case,—the next point is to settle how it can be best carried into effect. If the estimate of profits, formed by the Committee, be just, I think Government would not require to give themselves much more trouble about it. Some capitalists would soon undertake the job, with a far better chance of economical management than Government could ever hope to effect.

Rather than counsel Government to undertake it themselves, I would propose, that failing any private capitalist, a joint stock scheme be propounded for general consideration.

*(Signed)* D. M'FARLAN,
*Chief Magistrate.*

(True Copy,)
*(Signed)* G. YOUNG,
*Secretary Military Board.*

(True Copy,)
*(Signed)* T. H. MADDOCK,
*Offg. Secy. to the Govt. of India.*

# No. VII.

## EXTRACT FROM A DISPATCH, TO THE HONORABLE THE COURT OF DIRECTORS, OF THE EAST INDIA COMPANY IN THE REVENUE DEPARTMENT, DATED THE 23RD DECEMBER, 1835. No. 10.

Drainage of Salt-water Lake.

76. The Dispatch of your Honorable Court (No. 1, of 1830,) dated the 10th November 1830, on the subject of Draining the Salt-water Lake in the vicinity of Calcutta, and improving the course of the Circular Canal, having reached the Presidency during the absence of the Right Honorable the late Governor General at Simla, the subject was referred for his Lordship's consideration; and the consideration thereof, was, by him, suspended until his return to Calcutta,—when the whole papers connected with it, were transferred, through his Lordship's Private Secretary, to the Military Board.

77. As a preliminary step, the Board referred the subject for report to a Committee, consisting of the officers named in the margin,* with orders to report their opinion on the following points.

* Captain W. N. Forbes, Captain Thomson, and Mr. James Prinsep.

*First.* As to the expediency of undertaking the work with reference to its probable influence on the health of the Inhabitants of Calcutta, and to the return which may be expected from the outlay.

*Second.* On the best mode of executing the work.

*Third.* On the expence and length of time that would be required for its completion.

*Lastly.* On the effect it would have on the Drainage of Calcutta.

78. The above named Committee reported that entirely banking out salt water and effectually draining off rain, and alluvion charged river water, would most materially improve the salubrity of Calcutta, and of the country adjacent. The Committee felt it difficult to appreciate the improvement, or accurately to estimate the value of the reclaimed land, but they believed, from the statements of the executive officers, that the objects contemplated might be effected with a return of 10 per cent on the outlay.

79. In the opinion of the Committee, the best mode of executing the work would be, by banking out the salt water, and by providing sluices for the discharge, at ebb tide, of rain water, or of alluvion charged water admitted by the Canal, and by a feeder, to be constructed so as to join the Hooghly and the Upper end of the Lake, for the purposes of irrigation, of ameliorating the soil, and of raising the level of the bed of the Lakes by warping.

80. The expence of the work the Committee estimated at 2 lacs of rupees, exclusive of the purchase of the land,—and they were of opinion that a period of five years would be required to complete the entire work.

81. The Committee did not contemplate that the drainage of that part of Calcutta lying to the Northward of the Durrumtollah road would in any way be affected by the

works proposed, but they were of opinion that the drainage of the ground situated to the Southward of that road might be much improved by them, as they would afford an increased fall of from 2 to 3 feet.

82. For the opinions entertained by the Members of the Military Board on the scheme presented by the Committee, we beg permission to refer your Honorable Court to their letter dated the 7th February 1834, enclosing the separate Minutes of their Members. These papers were all brought upon record on the 5th March last, but no orders were passed upon them by the Right Honorable the late Governor General in Council, and the subject has not since been resumed by us. Mis. Rev. Cons. 6th March, 1835. No. 8 to 11.

(A true Copy,)

*(Signed)* T. H. MADDOCK,

*Secretary to the Govt. of India*

## No. VIII.

[EXTRACT OF A LETTER FROM MR. SECRETARY R. D. MANGLES TO THE MILITARY BOARD, TRANSMITTING A DISPATCH, DATED 18TH JANUARY 1837, FROM THE HONORABLE COURT OF DIRECTORS, TO THE ADDRESS OF THE GOVERNMENT OF INDIA.]

No. 636

Govt. of Bengal,

Miscellaneous, Revenue

Proc. 9th May, 1837 No. 5

The information called for in paragraphs 27 and 28, of the Honorable Court's present Dispatch, relates to the Draining of the Salt Water Lake, adverted to in your Board's letter No. 4614, dated the 7th of February 1834. That communication, with the measures proposed by the Committee appointed to report on the subject, was brought to the notice of the Honorable Court in a Dispatch of the Council of India, dated the 23rd of December 1835, but as no reply has yet been received to that Dispatch, his Lordship deems it unnecessary to revive the subject at present.

See Miscellaneous Revenue, Consultation of the Government of India, 5th March 1835, Nos 8 to 11—Paragraphs 76 to 82 of No. 10

I have, &c.

R. D. MANGLES,

*Secy. Govt. of Bengal*

## No. VIII. (A.)

[*Extract of a Dispatch from the Honorable Court of Directors, to the address of the Government of India No. 2, of 1837. Revenue Department.*]

Para 27. In our Dispatch, dated the 10th November 1830, in which we took into consideration the proposal of the late Governor General, to change the original plan of the Eastern Canal by making it pass to the Westward of the Salt Water Lake, instead of through it,—we directed you, in the event of your undertaking the work, to be specially careful "to obtain the most absolute accuracy in respect of the Soil and the Levels."

28. We desire to be informed if those directions have been attended to, and what are the results.

We are, &c

LONDON (True Copy) (*Signed*) W H MACNAGHTEN,
18*th January*, 1837. *Secretary to the Govt of India*

(True Copy) (*Signed*) ROSS D MANGLES,
REVENUE DEPARTMENT, *Secretary to the Govt of Bengal*
9*th May*, 1837

## No. IX.

EXTRACT FROM A DISPATCH FROM THE HONORABLE COURT OF DIRECTORS, No. 4, DATED THE 2ND MAY, 1838, IN THE REVENUE DEPARTMENT

* Captain W N Forbes, Captain Thomson, Mr J Prinsep.
Paras 76 to 82 of Dispatch of the Council of India of the 23d December, 1835, Drainage of the Salt Water Lake

Para. 41 The Committee, to whom the consideration of this subject was referred,* reported that the work would unquestionably most materially improve the salubrity of Calcutta and the country adjacent; that the best mode of proceeding would be by "embanking out "the Salt Water, and by providing sluices for the discharge at ebb-tide of rain-water or of "alluvion-charged water, admitted by the Canal, and by a feeder, joining the Hooghly and the "upper end of the Lake, for the purposes of irrigation, of ameliorating the soil, and of raising "the level of the bed of the Lakes by warping;" that the probable expense, exclusive of the purchase of land, and exclusive of the feeder, would be about two lacs of Rupees; and that it would require a period of five years to complete the work.

42 Colonel Galloway objected to the plan of embanking, and maintained, in an able Minute, that the first step to be taken ought to be a process of warping to extend over a certain portion of the Lake; which, if successful, would reclaim about 10,000 begahs of the most valuable part, and do more than defray the expense.

43. We find Colonel Anbury, the chief engineer, also differing from the Committee, whose report he designated as "altogether undigested" and "unexplained"

44. Colonel Craigie, on the contrary, we observe, applauds the Report of the Committee, and recommends its publication;—while the chief magistrate, Mr. McFarlan, throws out a somewhat important suggestion, viz. that "It is quite possible that an extended rice "marsh, into which it is probable that the Salt Water Lake would in time be converted, "might not be less productive of noxious vapour, than the surface of a Salt Lake."

45. On the general subject of the paragraphs before us, you are already in possession of our sentiments, and we do not see occasion, from a perusal of the documents now transmitted, which are unaccompanied by the expression of any opinion on the part of your Government, to add to the instructions contained in our dispatch of the 10th November, 1830.

46. You have not, it appears, taken any proceeding in the matter, beyond recording the reports and opinions above referred to; we think on a subject so immediately interesting to the resident public of Calcutta, the greatest possible degree of publicity should be given to the information you have obtained, and we are inclined to the opinion expressed by Mr. McFarlan, that if it can be made apparent that the undertaking will produce a return of ten per cent. on the outlay, there will be no want of capitalists to secure the completion of the work without the interference of your Government.

(True Extract.) FRED. JAS. HALLIDAY.

*Secretary to the Govt. of Bengal*

REVENUE DEPARTMENT.
*18th September*, 1838.

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# No. X.

## EXTRACT FROM A RESOLUTION BY THE HONORABLE THE PRESIDENT OF THE COUNCIL OF INDIA IN COUNCIL, IN THE REVENUE DEPARTMENT, DATED THE 20TH AUGUST, 1838.

Para. 5. With reference to paragraph 46, the Honorable the President in Council resolves—That copies of the papers noted on the margin, be forwarded to the Government of Bengal, with a request that those papers, with an extract (Para. 41 to 46,) from the Honorable Court's Dispatch, and all papers relative to the Drainage of the Salt Water Lake, recorded on the proceedings of the Bengal Government, may be forwarded for the consideration, and the Report of the General Committee of Municipal Inquiry now sitting in Calcutta.

India Miscellaneous Revenue. Consultation. 5th March, 1835. Nos. 8 to 11.

(True Extract.)

F. J. HALLIDAY.

*Secy. to the Govt. of Bengal.*

REVENUE DEPARTMENT,
*18th Sept.*, 1838.

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# No. XI.

## To THE MUNICIPAL COMMITTEE.

No. 1647.

*Revenue Department.*

Recorded papers of 16th Feb. 1830, Nos. 7 to 14.
† Ditto, of 9th May 1837. No. 5.
‡ Ditto, 12th September 1837. No. 1 to 5.
Extract from Honorable Court's Dispatch No. 4 of 2nd May 1838, paragraphs 41 to 46.
Extract from a Resolution by the Honorable the President of the Council of India, in Council, in the Revenue Department, under date the 20th August 1838, with copies of the Papers therein referred to.

GENTLEMEN,

I am directed by the Honorable the Deputy Governor of Bengal, to transmit the papers noted on the margin,* relative to the Drainage of the Salt Water Lake, and to state, that his Honor will be happy to be favored with the Committee's opinion on the subject.

I have the honor to be, Gentlemen,

Your obedient humble Servant,

FRED. JAS. HALLIDAY,

*Secretary to the Govt. of Bengal.*

FORT WILLIAM,
18*th September*, 1838.

* Some of the official papers which have been printed thus far in this Appendix, and not noted as having been transmitted with the above letter of Mr. Secretary Halliday, have since been obtained from his Department, while others have been obtained from the Military Board, and elsewhere.

† A portion of this Paper, printed at pages 54 55—but the whole will be found printed in Appendix to Appendix (G), Vide page

‡ This Paper will be found printed in Appendix to Appendix (G) Vide page —J. M

# APPENDIX TO APPENDIX (G)

## Contents.

PAGE.

# APPENDIX TO APPENDIX (G.)

## A

No 1

## MEMOIR,

Territorial Department Revenue Consultations of the
*28th July 1821 No 6 and 16th February 1830 No.*

*By Lieutenant J. A. SCHALCH, 14th Regiment N. I., Deputy Assistant Quarter-Master General of the Army, on a Plan for the Formation of an easy and permanent Communication between the Upper and Eastern Provinces of India and Calcutta by Water, through the Soondurbund passages and Salt Water Lake during the dry Season.*

THE want of a free navigation between the Eastern and Upper Provinces, and Calcutta, during the months of January, February, March, April, and May, when most of the rivers which branch off from the Ganges become too shallow for large boats, has long been felt and considerable expense has been incurred to remedy the evil, but hitherto without effect; every succeeding year bringing with it additional complaints of the obstructed state of the rivers, and the increased delay in the navigation. Various plans have been contemplated, and resorted to, but they all appear to have been founded on one and the same erroneous theory, and have, in consequence, produced similar unsuccessful results.

In Europe, and particularly in Great Britain, Canal Navigation of late has been brought rapidly to a degree of perfection, which, a century back, could scarcely have been anticipated by even the most sanguine Much has consequently been written and said on the subject, and certain rules and axioms derived from extensive experience established: but however suitable they may be to the countries in which they were formed, they must fail in others where they cannot be applied under similar circumstances.

In Europe, the greatest difficulty opposed to the establishment of canals, lies in carrying a sufficient body of water over great inequalities of ground by means of locks; but when once formed, they will remain unaltered for ages. In the plains of Bengal, on the contrary, the very reverse takes place. There is no difficulty or obstacle in forming a canal, the country being an uniform flat, and the soil easy of excavation. The grand point required, therefore, is, to preserve the canal in a navigable state, after it is once formed. Before proceeding to the plan proposed, I shall endeavour to shew, that the difficulty of keeping a canal open, in the higher parts of Bengal, is so great as to oppose an insurmountable obstacle to success; the beds of the Ganges and its dependant streams, having in that part of the country a natural tendency to be constantly changing or filling up.

Both Major Rennel and Colonel Colebrooke, who, of all others, have paid the most attention to the subject, are decidedly of this opinion. The former observes: "I can easily suppose, that if the Ganges was turned into a straight canal, cut through the ground it now traverses in the most winding parts of its course, its straightness would

Vide Rennell's Memoir, p. 214.

be of short duration. Some yielding part of the bank, or that which happened to be the most strongly acted on, would first be corroded or dissolved: thus a bay or cavity would be formed on the side of the bank. This begets an inflexion of the current, which, falling obliquely on the side of the bay, corrodes it incessantly. When the current has passed the innermost part of the bay, it receives a new direction, and is thrown obliquely towards the opposite side of the canal, depositing in its way the matter excavated from the bay, and which begins to form a shallow or bank contiguous to the border of the canal.* Here then is the origin of such windings as owe their existence to the nature of the soil. The bay, so corroded, in time becomes large enough to give a new direction to the body of the canal; and the matter excavated from the bay, is so disposed, as to assist in throwing the current against the opposite bank; where a process, similar to that I have been describing, will be begun. The action of the current on the bank will also have the effect of deepening the border of the channel near it; and this again increases the velocity of the current in that part. Thus would the canal gradually take a new form, till it became what the river now is. Even when the windings have lessened the descent one-half, we still find the current too powerful for the banks to withstand it."

In another place, speaking of the changes which happen in the beds of the Ganges, he says: "The experience of these changes should operate against attempting canals of any length in the higher parts of the country, and I much doubt, if any in the lower parts would long continue navigable."*

atic Researches
ol. vii. p. 26

Colonel Colebrooke also observes, on the cuts made in the Baugretty to straighten its course: "There is, however, no other advantage in making such cuts than rendering the passage somewhat shorter by water; and it is a question worth considering, whether by *shortening* the *course* of any river, we may not render it less navigable; for the more a river winds, the slower will be its current, and consequently its waters will not be drained off so soon. Another effect of the shortening its course might be, that, owing to the greater rapidity of the current acting against the sides in a loose soil, it might too much enlarge the capacity of its bed, the effect of which would be to produce a proportional degree of shallowness in the middle of the stream."

The fact of the Baugretty, the Jellinghee, and the Mattabanga rivers having been unnavigable for many late seasons, notwithstanding the expense and labour which have at different times been bestowed to keep their channels open, is, of itself, a most convincing proof of the inutility of attempting to form any permanent communication between the Ganges and the Baugretty or Hoogly, by their means; and the fate of all cuts of communication between their occasionally obstructed heads and the great river, may be conjectured from that which was made near Sooty, to join the Ganges and Baugretty. I had an opportunity of seeing it when only a few yards wide, but the stream was no sooner admitted, than it quickly expanded to as many hundred; and two years after its completion, not a trace of its existence remained. Only a few months ago, in passing up the river, the middle of one of the principal streams of the Ganges was pointed out to me as the spot where the excavation had been made.

It often happens, that in the pursuit of a favourite object, circumstances of great importance are overlooked, because their effects are too slow and remote to enter into immediate calculation; but though slow in their progress, they may nevertheless be so sure in their effects, as to bring with them consequences of a very momentous and even fatal nature. Thus in all the projects to keep open the communication between the Upper Provinces and Calcutta, by means of the rivers flowing from the great Ganges into the

* Major Rennell in this place alludes particularly to the tract of country at the head of the Jellinghee and Matabangah rivers on the right bank of the Ganges; and generally to such parts of Bengal where similar changes to what he describes are observed in the beds of the river.

Hoogly, it seems altogether to have escaped observation, that by straightening their courses, and employing machinery to free their beds from the accumulated sand, that very sand is hastened down to a part of the river where it is of the greatest consequence to have a free passage, viz. between the metropolis and the sea, where, on being stopped by the tide, its deposition must materially tend to increase the height of the sandbanks, and obstruct the outward passage. Surely this is a subject worthy of the most serious consideration. Slow has hitherto been the process; but that it is sure, appears undoubted, from the well known increase to the sands of the river of late years. Were it possible so much to retard the progress of the sand down the Hoogly, (by encouraging the windings of the river, and the formation of sandbanks at its efflux from the Ganges,) so that it might be deposited before it reaches Calcutta, the river in that case would become similar to the Issamutty, Cobbaduck, and others of the Soondurbunds, which at the same distance from the sea as Calcutta, are free from sand, and having become little else than tideways, the sandbanks at their mouths have remained stationary, and without further increase; nor have the beds of these rivers at all filled up, in the course of many years; the soundings taken in 1817 agreeing with those made by Rennell at least 40 years ago.

Having thus, in some measure, pointed out the inutility, as well as danger of attempting to form direct canals between the Ganges and Hoogly, I am come to the main object of this Memoir, which is, to offer for consideration a plan for opening a free communication between the Upper and Eastern Provinces of India, and the Hoogly river at Calcutta, entirely independent of the caprices of the Baugretty and other *branches* of the Delta in the upper part of their course; and which shall promise not only to be permanent, and free from the objections which have accompanied former plans, but shall repay in a short period of time the expense of excavation; and ultimately become a source of considerable revenue to Government, or profit to any body of individuals who may embark in the speculation.

Although the country towards the head of the Delta is unfit for canal navigation, from the causes above mentioned, the same objections do not apply to that portion of Bengal which is situated within the influence of the tide, and which, on the contrary, appears to be peculiarly adapted for such an undertaking. The surface of the ground is nearly on a level with the water at high tide, consequently the expense of excavation will be trifling, and no locks will be required, as the numerous inlets from the sea will always afford a sufficient supply of water, and when once the canal is made, it will be liable to suffer no alteration, the alternate flux and reflux of the tide, far from affecting the banks, operating against their sides in such a manner as to preserve their original form undisturbed: at least during the late survey of the Soondurbunds, in which I was an assistant, the different small nullahs situated near the line of the proposed canals were found to be nearly in the same state as when surveyed by Major Rennell. The reason appears obvious, the water holds little or no sand in suspension and the deposition of mud is trifling. As one instance, may be noticed *Goodlad's Creek*, which was excavated in 1795-6, but has not yet become at all obstructed, nor do I think it has since experienced any change. The cut made by Lieutenant Morrison, of Engineers, having retained its original form, may be mentioned as another instance of the durability of such works in this part of the country. [Vide map, 1st.]

That this navigation should have been so long disregarded, may perhaps be attributed to the accidental circumstance of the Matabangah and Baugretty, having continued open for several years, and to the subsequent partial, though inefficient endeavours, at removing the obstruction by drags, cuts, &c. The total failure, however, of these attempts, in every instance in which they have been resorted to, affords an unequivocal proof of their insufficiency.

To render the plan as perspicuous as possible, I shall discuss it under the following heads:—

1st. A general description.

2nd. A detailed account of the proposed Canals, and their connecting Streams.

3rd. The Expense.

4th. The Profit to be hereafter derived.

5th. The advantages to the Public.

6th. The Objections.

The Chundnah river has never yet been so much obstructed as to impede the progress of the largest boats; and the Gurroy, a branch of the same river, although not navigable throughout the year when Major Rennell wrote, now assumes an appearance equally favourable to permanent navigation;—(an explanation of the cause of which will be attempted in another place.) These are consequently resorted to by the Up-Country and Eastern trade boats, when all the other passages to Calcutta are unavailable. These rivers strike off from the Ganges, the former at Koostee, and the latter at Moddapoor, and they ultimately unite at Mosundurpoor, in the Jessore district, flowing into the Soondurbund passage at the village of Allipore, on the Boirub, near Koolna, (vide map 1st, fig. 1st.)—hence the route lies through the Soondurbunds and Tolly's Nullah to Calcutta.

The navigation as far as the Soondurbunds is perfectly safe; it then becomes dangerous to boats heavily laden with merchandize, from the great breadth and depth of some of the rivers which form a part of the passage, particularly the point at the head of the spacious inlet called the Roymungul, and the crossing of another, termed the Seepsah, improperly the Murjattah, in the maps, (vide map 1st:) independent of which, the natives are strongly averse to this route, from the dread of tigers, the danger of cooking ashore, the want of fresh water, and the delay attending the passage through Tolly's Nullah.

When Tolly's Nullah was first excavated and brought into use, it was perhaps sufficiently large for the trade which had then to avail itself of the benefit it offered; but that it is quite inadequate to the present navigation, is evident from the fact, that at certain seasons of the year, when a free passage is most required, *it is choaked* up with boats all the way from its junction with the Hoogly to a distance of three or four miles on the other side of Gurriahaut; indeed many of these boats, finding a further progress hopeless, are compelled to deposit their burdens on the bank of the Nullah, to be afterwards transported to Calcutta, either in smaller boats or by a land carriage of seven or eight miles. The increased population of the town demanding a larger supply of fuel, the wood-boats, which are the principal cause of this obstruction in the Nullah, have increased in proportion; and being now necessitated to load at a greater distance, and in larger rivers than formerly, the size of the boats has also become greater. When two of this description of craft happen to be brought to an opposite bank, it is with difficulty an ordinary Budgrow or grain boat can pass between them, even at the height of the tide; and as the tide falls, and the surface of water decreases, all the boats in the Nullah jam together, causing much damage, and totally shutting the passage.

What I propose to be done, therefore, is to make one grand line of water communication between the Upper Provinces and the eastern side of Bengal and Calcutta, open and secure for every description of boat, by forming a junction between the Gurroy and Hoogly rivers, by means of canals at the head of the Soondurbunds; lessening the expense by taking advantage of such Nullahs as flow in a suitable direction, thus avoiding the large

rivers, and the inconveniences of the present route Luckily, the facilities for the accomplishment of this object are greater than might be expected, on considering that the line extends in a direction which might be supposed to cut *perpendicularly* the general course of the rivers

The new route can be easily traced in the map, [1st,] by a red, and the old by a black dotted line.

I have already observed, that the navigation by means of the Gurroy which flowing towards the sea assumes successively the name of the Barashee, the Moodoomuttee, and Hooringotta, and by the Attarebanke Nullah and Boirub, (vide map 3rd,) is perfectly safe until reaching Koolna, which may be considered the commencement of the Soondurbund passage, as it is here the pilots station themselves From this point I shall therefore start, considering it as the Eastern extremity of my proposed line and proceeding along it to Calcutta, I shall enter into minute detail of every circumstance, whether of a local or other nature, which might in any way affect the execution of the scheme This measure I conceive to be the more necessary to be adopted, as a considerable part of the country which will come under review is imperfectly known, and in consequence, a judgment as to the merits of my plan must here be formed from the information given by myself.

Leaving Koolna, the old route is followed as far down as the mouth of the Bytaghatta khaul, at Hutbarree; it is then deserted, and the new route lies through the Bytaghatta, Salta, Taily Kally, Bungurria, and Nuzzerpoor khaul, to the back of the village of Cobulmunee, on the banks of the Cobbaduck, with which a junction is formed, by means of a canal, in the direction laid down in the map From the entrance of the Bytaghatta khaul to the Nullah A, where the tide is met from the Salta river there is a sufficient breadth and depth of water for the largest boats; the Nullah then narrows, and is much obstructed by overhanging branches of trees and brushwood, which according to the custom of the country is allowed to grow on the banks, forming a belt on each side between 10 and 20 feet in breadth. It would be necessary to clear away this, to form a tracking path the whole length, and slope down the sides of that part of the Nullah between A and the Salta river, which would give a sufficiently increased breadth, and earth for that purpose.

Nothing further is required from the Salta river to B, on the Nuzzurpoor khaul, than making a path round the reach of the Taily Kallie river, from X to Y, to track boats against a counter current, which will generally be met with here. That part of the Nuzzurpoor khaul which lies between B and C, must have its banks freed from brushwood, and sloped down in the same manner as that recommended for the Bytaghatta. I surveyed and took levels of the ground between C and D, and found it to be one mile and three furlongs in length, and on an average three feet higher than high water mark on the nullah. The rise and fall of the tide is seven feet in the nullah, and four feet in the Cobbaduck The depth necessary for the canal to have seven feet at low water, would therefore be seventeen feet, for which, and a breadth of sixty feet, at high water mark, the calculations have been made. Boats either to or from Calcutta, will generally arrive at this canal at high water.

In order to avoid the very considerable bend of the Cobbaduck between this canal and Taikah, it would be necessary to cut through the isthmus at Naroolee, by doing which, a tide would be saved. The isthmus is 1,368 yards across. The mean level of the

ground above high water mark is three feet, and as the rise and fall of the tide is four feet, only fourteen feet need be excavated to secure a depth of seven feet at low water. The passage from Koolna to Taika will be shortened 18 hours by the new route. This is, however, but a trifling advantage, in comparison with the greater security of the navigation; as it cuts off one of the most dangerous of the Soondurbund rivers, and runs through a highly cultivated country the whole way.

We now join the old passage, and follow it to Bissunpoor, unless it should be thought advisable to carry a canal from Deacol to the Jaboona opposite to Hussienabad, as laid down in the map. This would materially shorten the route, and relieve Goodlad's creek from a number of boats with which it is in general crowded; but as these are the only advantages which would be attained, and as the present passage, although confined at Goodlad's creek, is in other respects good, and lies through a cultivated country, I have annexed this canal supplementarily to the scheme. Leaving Goodlad's creek, we trace the proposed new navigation up the Jaboona as far as Hussienabad, across the country, by a canal to Bussera; through the Ghaskalee, the Beharee, Koosree, and Bungur nullah, to the letter E, near the village of Gabtullah; from thence through another canal to the Bedadoory nullah, which leads to Tardah, where we again fall in with the present route. The detail of this part of the line is as follows. The ground between Hussienabad and Bussera is low, and may be taken on an average at two feet above high water mark. I found the tract too extensive to level instrumentally, but I obtained a tolerably good estimate of its height by observing the high water mark on the banks of some of the nullahs which intersect the line of the canal The rise and fall of the tide at Bussera is eight feet, which added to two feet, the height of the ground, and seven feet, the depth required at low water, gives seventeen feet for the depth of digging; for which the calculation is made, with a breadth of eighty feet at high water; giving this canal an increased breadth on account of its greater length. The Ghaskalee and Beharee nullahs are sufficiently broad and deep. The Koorsee khaul, from Makla to the Bogally, needs no further alterations than the clearance of its banks of the low jungle with which they are covered.

The nullah from E to F has breadth enough, but it would require to be deepened seven feet, as it is just dry at low water; it continues winding through low marshy land to Gabtullah, where it ends. Between Gubtullah and the Bedadoory at Narainpoor, the ground is about three feet above high water mark The rise and fall of the tide is 7 feet; the depth required in this place would therefore be seventeen feet, for which, and a breadth equal to the Hussienabad canal, the calculations are made. For the length, I have taken the whole distance from E to G, or 3½ miles.

The Bedadoory from Narainpoor to Pertabnugger, was formerly navigable for large boats, but it has latterly been shut up by bunds thrown across it in two places, and it has, in consequence, extended itself at those places into jeels. These bunds must therefore be removed, and others formed along the banks of the nullah, to prevent the overflow of the salt water. The old channel contains a sufficient quantity of water.

From Tardah, (vide map 2nd) we follow the red dotted line of the proposed route past Bamngottah, across the Salt lake, and up the Eastern canal, to within about 2,000 feet of the Circular road, where it turns to the right, and running parallel with the road, forms a junction with the river a little above Chitpore, at R.

In my original plan, I avoided suggesting a communication between the river Hoogly

and Salt Lake, from a dread of endangering the drainage of the town in the rains, which is almost entirely into the lake. But on making my plan public, so many advantages were pointed out to me, that would result from giving the harbour the situation now assigned it, that I again examined more attentively the relative levels of the river and lake for every month of the year, with a view to overcome, if possible, the difficulties which then presented themselves: and I now find, that by cutting off the communication during the rainy months, and which can be done at a trifling expense, no lock gates being necessary, the drainage will remain not only uninjured, but that by means of this canal, an entire new system of draining may be planned, which shall hold out the prospect of remedying the evils of the present mode, and afford health and comfort to the community at large. As this plan is intimately connected with that of the canal, I shall add it in an appendix.

In fig. 1st, map 2nd, is shewn the relative height of the river and Salt Lake, for every month in the year. In the dry season the river seldom rises eight feet above the lake at the highest state of the tide, and only remains at that height for a short space of time. The length of passage for the river water, before it disembogues into the lake, will be nine miles, consequently there will be a fall at high water of between 10 and 11 inches in the mile nearly, or 1 inch in 500 feet, which, according to Mr. Mann's calculation in the 69th vol. of the Phil. Trans. when the velocity depends on the fall alone, will not exceed three miles an hour, from which no damage to the banks need be apprehended.*

Having thus pointed out that a junction between the river and lake may be made, without any risk of danger to the town, I shall proceed with my remarks on this concluding part of the scheme. From Tarda to Bamingottah, on the margin of the lake, the nullah is broad and deep. From Bamingottah to the letter L. the breadth and depth of the channel through the lake is written down in the map. The bed of the lake in this part is dry for about three hours of the tide, in consequence of the water falling into the numerous nullahs which intersect it. K is the place fixed on to be the outlet of the channel into the lake; from this, it would be necessary to raise a bund on each side of the channel, 4 feet in height, and 10 in mean breadth; and widening the channel 20 feet. From L to M the lake has 3 feet water at the lowest state of the tide, which is here however scarcely perceptible. The channel would therefore only require to be deepened 4 feet, and widened to 70. When the river and lake become connected by a canal, we may assume, that at low water the surface of the last will have a slope equal to the difference of level of the lake and river at that time; and that at the intermediate parts, the surface will be depressed in proportion to its distance from K. At M the depression will be 2½ feet, at N 4, and at R 7. The mean depth to be dug in the Eastern canal, which has now 4 feet of water, will be about 6 feet. Its breadth is 80 feet at the eastern extremity, and narrowing to 60 at the bridge. From N to R, the ground averages at 11 feet higher than the surface of the lake. To obtain a depth of 7 feet at low water, the excavation must therefore be carried down 25 feet at R, the junction with the river, and 21 feet at the head of the Eastern canal. The calculations are made for a mean depth of 23 feet; and as this part is intended for boats to be in, I have taken its breadth at top at 138 feet, which, allowing for the slope of its sides, gives 90 feet for the surface of low water. Its length is 3 miles, 6 furlongs.

* From the slight manner in which this part of the plan is mentioned, it may be imagined by some, that due attention has not been paid to the difficulties likely to attend its execution. Such is not however the case, they have been duly considered, but their discussion would far exceed the limits an outline prescribes.

[Estimating the expense of excavating the canals on the Calcutta rates of tank digging, and including the charges for bridges, roads, and other works connected with the undertaking, the whole expense will amount to about Sa. Rs. 9,50,000

And it is calculated that the canal will yield, on being opened, an annual profit, after deducting the expense of repairs and establishment, of about Sa. Rs. 1,65,600]

If the harbour were given up, without restriction or toll, to the boats depositing their cargoes, it would be so crowded, that the passage would be obstructed. In order therefore to prevent too great a concourse, it would be necessary to levy a slight toll on all boats deriving the benefit of the harbour, either for loading or unloading, or a place of safety in stormy weather. Supposing the amount to be an anna a day upon every hundred maunds burthen, as the harbour will hold 330 boats of 1000 maunds, the yearly sum will amount to 75,281 rupees. From the great superiority which this passage will possess over all the present ones, we may safely conclude that it will be generally resorted to. In which case, supposing trade to continue at its present extent, the tonnage, at a rupee for every hundred maunds entering and leaving the canal, will amount to 80,000 rupees. But it cannot be doubted for a moment, that the trade to and from Calcutta will be greatly increased by the facilities of passage which the proposed line of canals will afford, in a season of the year the most favourable for the transportation of grain and other articles; and that the profits by toll will in consequence proportionally augment.

From my limited acquaintance with mercantile affairs, I am unable to say what may be the particular advantages that the internal trade of the country may derive from such a line of navigation as that proposed: these points are therefore resigned to the consideration of others more familiar with the subject than I am, and I shall restrict myself to a few general remarks that have presented themselves in the course of the present inquiry. The first is the great increase to trade, which experience shews has ever followed an increased facility of transportation. The certainty of the navigation; the lessening the number of wrecks; and the prevention of loss of property and damage arising from boats running frequently aground in the present passages; the convenience of the harbour for loading and unloading, and affording also a safe retreat from the dangers of the Hoogly in stormy weather; may be mentioned as the more prominent benefits that the plan holds out to the trade of the country. The formation of the canals must be attended with advantages to Government, that are too evident to require enumeration in this place. To the city—the improvement of the ground near the Circular Road, from the head of the Eastern canal to Chitpore; an increased salubrity from the state of cleanliness in which the drains will be kept by the adoption of the plan, before alluded to; the removal of the filth by under-ground passages to beyond the Circular Road, and ultimately to a distance of between 9 and 10 miles, is to be expected, together with a reduction in the price of fuel, and every other article of consumption.

I now come to the objections that have been, or may be urged, against the adoption of the scheme; the principal of which I conceive to be the following five—

1st. The rivers formerly navigable between the Ganges and Hoogly having of late ceased to be so, the same may happen to the Gurroy and Chundnah.

2nd. The Issamutty, the Baugretty, and even the Jellinghee, once navigable throughout the year, may again become so, (and which seems the more probable, from the unobstructed state of the Baugretty during the present dry season,) in which case the passage by the canals would be little frequented by the up-country or western trade boats.

3rd In the event of rival canals being cut in the upper part of the Baugretty or any of the above mentioned rivers being rendered navigable by art the circuitous route by the canals would be abandoned for the shorter one by the river.

4th. The land purchased along the Calcutta side of the Circular canal, may not realize by resale the sum calculated, which is nearly equal to the whole expense of the undertaking

5th. That the expense and difficulty of the work have been underrated.

In answer to the first objection; it has been before observed, that the Chundnah river has always been navigable, and the Gurroy river of late years, when the Matabanga and and Baugretty are closed. In order, if possible, to ascertain the cause of this, and the probability of their continuing open ; as also the changes that might be expected to take place at the heads of the other branches of the Ganges. I examined the right bank of the Ganges from Rajemahl to Koostee, and surveyed the Gurroy as low down as the Attaree Banka Nullah, which leads to Koolna. From Rajemahl to the village of Chocula, twelve miles in a direct line below the Matabanga, I found only a sandy soil, with little or no tenacity ; and in consequence, the channels of the upper parts of the rivers which branch off in this place are subject to great changes, as also to the danger of being entirely closed by the unfortunate deposition of a sandbank at the entrance. At the village of Chocula, on the contrary, the Ganges puts on a different appearance. The soil here assuming a more clayey nature, resists the current, which is deflected into the remarkable windings which the map of the river exhibits in this place. The Ganges likewise is here confined within a comparatively narrow channel, with an increased depth of water. At Koostee, I sounded with 120 feet of line but without effect. (Vide fig. 3rd, map 1st.) All these circumstances indicate the channel to be of stiff compact matter. At the entrance into the Gurroy, a black stratum of mould, (a specimen of which accompanies the plans,) rises about 2 feet above the surface of the river in January ; and judging from the section taken across the entrance, either this, or a stratum of equal consistency, must descend beyond the bottom of the channel, which is here about 50 feet deep. This forms a foundation for the looser soil above, which is thus in a great measure kept from being undermined and carried down the stream. Descending the Gurroy, the same black soil is seen at every projection of the bank, opposing the efforts of the current, which then acts in keeping the channel clear and free from sand. From Koostee to Gopaulgunge, I did not observe a single detached sand, and it is only where the river makes a sudden bend, that one is to be found on the eddy bank It might naturally be expected that a greater quantity of sand would be accumulated from the above causes, at the mouth of this branch of the Ganges, and such is found to be the case for the Hooringottah, which is a prolongation of the Gurroy and Chundnah united, is nearly choked with sandbanks where the tides begin to act with sufficient force to deposit the suspended matter. It may therefore be presumed, that this river will not be liable to the same changes which have attended the others, and that we may rely on its remaining navigable for a great number of years.

As to the second objection, experience offers no instance of a river, which has once become unnavigable for any great length of course, from the deposition of the matter carried down its stream, whether sand or gravel, ever returning naturally to a navigable state Many examples, on the contrary, might be adduced to shew, (what indeed might be expected,) their unabating tendency to fill up their beds. The bed of the Dummoda has risen above the level of the adjacent country. The great and in some cases, total change of course of many of the Indian rivers, may be attributed to the rising of their beds by which

they are forced into new channels. The beds of the Italian rivers may also be brought forward as instances in point, particularly that of the Po, which from successive embankments, has risen in many places to thirty feet above the level of the adjacent country; and the most fearful apprehensions are entertained, that at no very distant period of time, the whole country known by the name of the Polesino, or the Delta of the Po, is destined to become an extensive and useless marsh. It is the opinion of many, that the obstructed state of the Baugretty arises entirely from the accumulation of sand at the head of the river; and that if it were removed, there would be no hindrance to the navigation in the rest of its course. The sections that I took at different places, prove, however, the obstructions not to be so partial as is supposed; for instance, between Koolna and Nuddea, at Moorshedabad, and at Sooty, there was the same depth of four feet. From which I infer, that the bed of the Baugretty, generally from Sooty to Koolna, may be taken as being three feet depressed in ordinary seasons, below the surface of the Ganges; allowing for the slope of the country, and that the degree of practicability of the Baugretty depends not on any change in the sands but entirely on the height of the Ganges. The Baugretty is seldom navigable for boats of 500 maunds burden in January: yet it remained so in that month of the present year, and I was informed by the boatmen of the different ferries, where I made inquiries, that the river was about a foot higher than is usually experienced at the same season; yet, under these circumstances, it was then impracticable for boats exceeding 500 maunds burden; and it may I think with safety be admitted, that the Baugretty will seldom be so completely open, but that a very great proportion of the Up-country or Western trade boats will have to resort to the proposed new route. What has been said in regard to the Baugretty, will apply in like manner to the Matabanga and Jellinghee rivers; and as these were impassable in January for boats of 200 maunds burden, no hopes can reasonably be entertained of their becoming rival passages to the canal.

I have already shewn the difficulty, if not the impossibility, of making permanent canals in the upper parts of Bengal, which comprises generally the answer to the objection now under consideration. I should, therefore, have thought it superfluous adding any thing further in this place, had not a plan been proposed for carrying a canal from Rajemahl to below Sooty, and as the feasibility of this plan, which has many advocates, may be brought forward as an objection to the one proposed by me, it becomes necessary to point out in a distinct manner what I conceive the objections to its success. The groundwork of the plan is, I believe, as follows: That at or near Rajemahl, a spot might be found where the Ganges is steady in its course, and where it would not desert the entrance of a canal, by throwing up sand banks, as it has done at the opening into some of its natural branches. That the canal carried from thence, through a compact stiff soil, would be in no danger of having it banks washed away; and that the large body of water which would be conveyed by it into the Baugretty, would keep the channel of that river more free from sand than it is at present. That a greater body of water brought into the Baugretty would have the effect of displacing the sands at the bottom of its channel, appears to be very problematical, on considering that even after the floods of the rainy season, when the column of water has been increased 32 feet in height, no effect is produced in deepening the bed, which may I think be thus accounted for. The soil through which the river flows, is almost wholly composed of sandy particles, which have a considerable degree of gravity, with scarcely any of tenacity; the consequence of which is, that they are easily detached from the sides but are with difficulty removed from the bottom. Hence a river, flowing through such a soil

with any increase of water, will enlarge its section in breadth, and not in depth, finding less opposition in effecting the former than the latter. In this way may be traced the creation and destruction of the great sandbanks of the Ganges. A sunken boat, or tree, by retarding the current, allows the gravity of the sand to act in precipitating it to the bottom; while the stream being too powerless to displace the incipient collection, it becomes the cause of a still further accumulation, and finally gives a new direction to the current, which striking obliquely the sides of any contiguous bank, crumbles it down, and carries away the sand, to undergo a progress similar to that which I have just described.

I shall now endeavour to shew, that the Ganges is not more steady in its course at Rajemahl than at other places; and that the expense of the canal would of itself be an insuperable bar to the undertaking. With the exception of that small portion of the town of Rajemahl which lies between the bastions of the palace and the burying place of Futteh Jung, which forms the bight in which boats occasionally bring to, there is no other part where the Ganges has continued a steady course for any length of time, and even here the encroachments of the river are visible, although in a less degree, from the rocky nature of the soil. About 40 years ago, the Ganges flowed close to the town along its whole length: it is now 400 yards distant from the western extremity. From a late change in the direction of the current, it is again making its approaches. The main branch of the Ganges, only a few years back, ran close by Oudanullah, which in the dry season is now two miles from the nearest stream.—In further proofs of the changes in this part of the river, it may be mentioned, that about the year 1600, the Ganges held its course under the walls of Gour. It had some time previous to this been shifting gradually its bed, but it then left the vicinity of that city, and approached the Rajemahl hills. From Rajemahl to the Baugretty a line of soil could no doubt be found of such consistency that the banks of a canal, therein excavated, would withstand the force of the current; but the labour and expense of working on such a soil would be very considerable. It is besides generally elevated several feet above the common adjacent alluvial land, which may be said to be on a level with the river at the height of the rains. In order, therefore, to have a sufficient depth of water in the dry weather, it would be necessary to dig seven or eight feet below the surface of the river at that time. And as the rise of the river is 32 feet, the depth of digging, on the lowest computation, would be 42 feet. A mile of canal of this depth, and 60 feet broad at the surface of the water, would cost 71,000 Rs. and as the distance could not be less than 42 miles, the expense of excavating would alone amount to (31,00,000 Rs.) thirty-one lakhs of rupees. Independent, however, of the very great expense that would attend the completion of such a work, no hope could be entertained of an unimpaired navigation for any length of time; for in its course, as appears by the map, it would be intersected by a number of hill streams, which, in the rainy season, bringing down quantities of sand and other matter, would infallibly choak up the canal at the places where they entered it.

With regard to the fourth objection, I shall briefly observe, that in forming an estimate of the probable increase of value of the land along the Circular canal, I have been guided by the augmented value of the land contiguous to the Eastern canal, which has risen to 300 and 400 rupees a cottah, in places where it was selling for 16 and 20 before the canal was opened.

In making out the estimate of the expense of the undertaking, I have calculated for dimensions exceeding the actual measurements: and having besides allowed a lakh of rupees

for contingencies, it may be hoped, that the sum total will more than cover the expense. It has been endeavoured to compare the expense of the proposed canals with that of works of the same kind in Europe; but the dissimilarity is so great between them, that they will scarcely admit of a comparison. In Europe, the mere excavating the channel bears but a small proportion to the other attendant charges of locks, aqueducts, bridges, &c. In the estimate for the Forth and Clyde Canal, which is about the same length as the whole aggregate extent of those under consideration, the charge for digging is only 16,632*l*., whereas the sum total is no less than 78,970*l*. Counterbalancing the extra charges, none of which enter into our scheme, with those for extra digging, it will appear that my estimate exceeds that of the Forth and Clyde Canal by about one-third.

As to the difficulties attending the execution of the plan, after due and mature consideration, I must again repeat, that I have found none that may not be overcome by common ability and attention, or that anywise affect the ultimate success; and I trust, the further experience I have acquired in a late visit to those parts of the country which come under review, for the sole purpose of ascertaining the practicability of the scheme, has qualified me in some measure to form a correct judgment on the subject. But a scheme of such magnitude as the one proposed, will not be entered on without submitting its pretensions to the fullest publicity, or laying it unreservedly open to the severe scrutiny of competent judges. To such I now leave it, in the sanguine hope that the advantages will be found to outweigh the defects, and that professing as it does to hold out so many commercial and public benefits, it will meet with that consideration, to which the subject is undoubtedly entitled, whatever the merits of any particular plan may be; and that this will not be abandoned until its fallacy be clearly shewn, and the arguments I have adduced be unanswerably subverted.

# A 1.

## APPENDIX TO FOREGOING MEMOIR.

Of all improvements, of which a town is susceptible, those which contribute to increased salubrity, should precede such as have merely convenience or ornament for their object: unfortunately, the first involves a considerable expense, with little display, while in the two last, a comparatively small expenditure produces a striking and immediate effect. Hence we see the more beneficial improvements giving way to the more splendid and dazzling; and it is a subject of still greater regret, that such should be the case in the infancy of a city, and the early stage of improvement, when many circumstances conspire to favour the execution of plans, which gradually lessen as it becomes more inhabited, and the right and more immediate interest of individuals tend to oppose their operation. It is only by consulting the peculiar localities of a town, and by taking advantage of them, as far as they will admit, that any improvement in its atmosphere can be expected. Those of Calcutta are too apparent to escape the notice of the most unobservant; and it need scarcely be mentioned, that they consist in the lowness of its site, numerous swamps in the most central parts the great height to which the floods of the river rise, the existence of an extensive morass bounding one-third of its circumference, together with a damp heated atmosphere, favourable to every description of putrefaction, and the absence of rain, except in a few occasional showers, for more than seven months in the year. Many of the evils arising from these causes may, it is hoped, be lessened by adopting a more effectual method of draining the town and by removing more speedily the filth, and offensive matter.

An ill-drained town, in a low situation, may be compared to an ill-flued house, which, the more beautiful the superstructure, the greater the regret, that so much labour and expense should have been exhausted in pleasing the eye, while the health and comfort of the tenant have been neglected.

It would be out of place here to enter into a further detail of the plan in contemplation, than its connexion with the foregoing scheme of the canals. I shall in consequence confine myself to what relates to it, and to a few of its leading features. The first is the construction of Sewers of a large capacity, from the Hoogly river to the Circular Canal, parallel with the principal streets running in that direction; of such depth, that the tide may enter them, washing out the contents of the drains into the canal. The whole will afterwards be carried to a distance of nine miles from the town, and ultimately by the numerous outlets from the Salt Lake, into the Soondurbunds. It is intended that these drains shall run behind the principal large streets, where the small number of pucka buildings will permit, otherwise under the streets themselves. In retired parts, the public privies might be placed over openings in the top. By this plan, the town would be cleared of filth every twelve hours, without any annoyance to the population, which will obviate the present offensive practice of its being carried openly and disgustingly through the streets From the report made to the magistrates, it appears, that the quantity of filth is not so much as to allow of any apprehensions of its rendering the canal unnavigable being

only one basket load to every hundred feet of length, and at this rate, one hour in the twenty-four would be sufficient for its removal. It is to be expected that a number of obstacles will be started against the plan ; more especially as the minutiæ of it have been left unnoticed.

There are, no doubt, many obstacles ; but none, it is hoped, that upon deliberate investigation, will be found to create a despair for its ultimate success. And when we consider the numerous advantages that will result from its adoption, we surely will not put in competition with them, either a few temporary objections, or the expense, which at the utmost will not exceed 50,000 rupees a mile. It is unnecessary to dwell on the evils of the present system of removing the ordure of the inhabitants ; indeed, they are well known, and too disgustingly familiar to the inhabitants in general ; while they are particularly offensive to those residing near Jackson's and Omratullah Ghauts, and to the shipping in the river. I shall only observe, that the adoption of the present plan will bring down on its promoters the blessing of the most considerable class of inhabitants, in point of numbers, who can then perform their ablutions, as sacredly enjoined by their religion, without having their feelings and prejudices daily outraged and wounded.

CALCUTTA, J. AUGS. SCHALCH, *Lieut.*
*June*, 1821. *Dep. Assist. Qr. Mr. Genl.*

# B

*Copy of a Resolution passed by the Governour General in Council on the foregoing plan of Lieut. J. Augs. Schalch.*

Territorial Department Revenue, Consultations,
*28th July* 1821, *No.* 7.

READ A REPORT FROM LIEUTENANT J. A. SCHALCH,

Resolution, *dated* *June*, 1821.

1. After carefully considering the above papers, his Lordship in Council is disposed to think very favourably of the plan proposed by Lieutenant Schalch, and highly applauds the zealous spirit which has stimulated him to the investigation, and the talent with which he has conducted it.

2. But although the sentiments of Government are thus favourable to the general scheme ; although the facts and observations stated by Lieutenant Schalch confirm the conclusions to which his Lordship in Council had been previously led, in regard to the channels through which a permanent communication with the great river was to be sought ; and although the several parts of his plan appear to be very ably and judiciously conceived, yet there are various points on which Government cannot immediately form any conclusive judgment, and which must be fully and carefully sifted, in considering the expediency of a work of so much importance and magnitude.

Res. 19th May, 1820.

3. Before therefore coming to any final decision on the matter, his Lordship in Council deems it necessary to receive the deliberate opinion of such persons as may appear most competent to appreciate the undertaking, in regard to the feasibility and probable permanence of the work ; to the nature and extent of the advantages to be expected from it, contrasted with those which are already enjoyed, or which could be attained through operations of a more limited nature, and to the probable charge to be incurred in its execution and maintenance.

4. For the full investigation of the above questions, it appears to his Lordship in Council to be desirable to seek the aid of a committee, constituted so as to embrace a considerable variety of information and research, proportioned to the variety of the matter to be inquired into; and for this purpose, his Lordship in Council proposes to select the several gentlemen whose names are noted in the margin. From some of these gentlemen, Government has indeed no direct title to demand the sacrifice of time and attention. But his Lordship in Council is fully satisfied, that all will cordially unite in the furtherance of an inquiry involving so many considerations of great publick interest.

Mr. W. B. Bayley.
" H. Shakespear.
" J. Young.
Capt. D. McLeod.
" H. Morrieson.
Mr. G. J. Gordon,

5. It appears unnecessary (even if such an anticipation of the various bearings of the subject were practicable,) to state in detail the different matters which the inquiries of the Committee are to embrace. These will naturally suggest themselves on a consideration of Lieutenant Schalch's report and plans, or will arise out of the results of future investigation.

6. The Committee will of course understand that though the drainage of the city is not necessarily connected with the proposed canal, yet the matter is one to which it is not the less desirable that their investigation and report should extend. The probable influence of the proposed work on the health and cleanliness of the city, is indeed as obvious a point of inquiry, as the degree in which it may be calculated to facilitate commercial intercourse.

7. It may be proper further to observe, that although the main design of Government in constituting the Committee, is to obtain from them such a report as shall enable it to decide on the general expediency of the proposed scheme, and the merit of its several parts, yet his Lordship in Council must also be anxious to receive a communication of their sentiments, (if generally favorable to the measure,) in regard to the best means of giving effect to it with economy and expedition. Government will also of course be happy to receive from the Committee, any suggestions which it may appear to them useful to offer in the way of improvement.

8. With respect to the manner in which the Committee are to conduct their investigation, or the form into which they are to reduce its results; few if any observations from Government can be necessary It must of course be the wish of his Lordship in Council, that the Committee should regulate their proceedings in the manner most convenient for themselves, without being shackled by any precise rules, beyond what they may impose on themselves, with a view to regularity and system.

9. Lieutenant Schalch will of course be ready to afford the Committee such written or personal explanations as they may require; and all publick officers connected with the tract of country through which the line of the canal runs, or with the Baugretty, Jellinghee or Matabanga rivers, will be instructed to afford them every aid and information which it may be in their power to furnish. They will likewise of course have access to any papers relating to the subject of their inquiries, which may be contained in any of the public offices at the Presidency; and they will themselves naturally apply to such individuals, as from professional pursuits, or local situations, may seem likely to communicate useful information or suggestions, or to give sound opinions.

1 Committee of Improvement
2 Magistrates of Calcutta.
3. Magistrate of the Suburbs.
4. Magistrate of the 24 Pergunnahs.
5. Collector of Ditto.
6. Salt Agent of Ditto.
7. Commissioner in the Soondurbunds.
8. Magistrate of Nuddeah.
9. Collector of Ditto
10. Magistrate of Jessore.
11. Collector of Ditto.
12. Salt Agent of Ditto
13. Magistrate of Backergunge
14. Collector of Ditto.
15. Committee of Embankments of Moorshedabad.
16. Lieutenant-Colonel Parlby.
17. Superintendent of Matabangha.

10. The Committee will employ such writers or other servants as they may find necessary; the expense incurred on this account, as well as any dis-

bursements made in preparing or copying plans, or other charges of a miscellaneous nature, to be charged by their President in a contingent bill, and passed on the authority of his signature.

11. Should the Committee, after consulting together, be of opinion, that it is necessary or desirable to afford them the aid of a Secretary, his Lordship in Council will be fully prepared to accede to any recommendation which they may submit to this effect.

(True Copy.) *(Signed)* HOLT MACKENZIE,
*Secretary to Government.*

TERRITORIAL DEPARTMENT
*July 28th*, 1821.

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## C

To W. B. BAYLEY, Esq.
H. SHAKESPEAR, Esq
J. YOUNG, Esq
CAPT. D. M'LEOD,
CAPT. H. MORRIESON,
G. J. GORDON, Esq.

Territorial Dept. Revenue

GENTLEMEN,

I am directed to inform you that his Excellency the Most Noble the Governor General in Council has this day been pleased to appoint you a Committee to consider and report on a plan proposed by Lieutenant J. A. Schalch, for opening a permanent communication with the great river, and other matters connected with that object.

2. A copy of the report submitted by Lieutenant Schalch, in explanation of his Scheme is herewith transmitted to you, together with the plans mentioned to accompany it. For your immediate information, in regard to the views and intentions of Government in constituting your Committee, I am directed further to transmit to you, copy of a Resolution this day passed by Government on the occasion.

I have, &c.
*(Signed)* H. MACKENZIE,
*Secretary to Government.*

COUNCIL CHAMBER,
*July 28th* 1821.

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# D

## SECOND APPENDIX TO FOREGOING MEMOIR.

*By Lieutenant* J. A. SCHALCH, *submitted by him to the Committee appointed to report upon his Plan*

Territorial Department Consultations
*28th July* 1821 *No* 6 *Procdg.* 16*th Feb.* 1830 *No.* 7

IN drawing up the plan now before the Committee, I found myself under the necessity of avoiding a prolix detail of each particular part, for two reasons; first, from a desire of placing at once the principal features of the whole in the clearest light possible, unobscured by the introduction of matter of minor importance; and, secondly, from the limited portion of time which my professional duties allowed me to devote to the subject.

Interested, as I must naturally be, in the result of the Committee's investigation, and prompted by the wish of lessening the trouble attendant on it as far as lies in my power, it appears to me that I may still offer to the notice of the Committee some further information, more particularly on that part of the scheme which comprehends the proposed junction of the Salt Lake and the river Hoogly. This I shall endeavour to do, by furnishing them with such theoretical and general observations as I conceive relate to, or are capable of elucidating it; that being undoubtedly, as far as the engineering part is concerned, the most important of the whole, as it involves, not only the greater share of the expense, but its failure might be attended with possible injury, or inconvenience, to the city of Calcutta.

By the levels of Calcutta, which were taken with great care, and which have been proved to be correct, as will be shewn hereafter, I found there was a difference of 12 feet between the surface of the Hoogly at the highest tide in the rains, and that of the Lake in the same season. In order that the Committee may satisfy itself as to the correctness of the Survey Observations from which this result, as well as the others which I shall have occasion to bring forward, have been obtained; I shall, for the sake of perspicuity, add them in a separate form, merely noticing here, that the levels taken in 1783, agree with those taken by myself within half an inch, the former being 12 feet 2½ inches, and the latter 12 feet 3 inches.

An objection has been started against the practicability of forming the proposed communication, on the grounds of the difference of level being so great, that the velocity of the communicating stream would be far beyond what its banks could withstand; and that, bursting through its feeble barriers, it would eventually not only carry with it ruin and destruction, but, emptying itself into the lake, would raise that body of water to a height that might endanger the greater part of the town. This opinion would appear to be founded on a comparison of the fall of the Ganges, with the fall which the proposed canal may be supposed to have; and it has been speciously argued, that, as even with a fall of 5 inches in the mile, the Ganges has a velocity of 5 miles an hour, the canal, with a fall nearly trebled, would have its rate proportionally increased.

I shall, in the first place, endeavour to shew, that the velocity of the Ganges, or indeed of any river, does not depend so much on its fall, as I believe is generally supposed; and that there are rules by which the absolute velocity of any canal or river, of known dimensions, may be obtained to a sufficient degree of accuracy for every practical purpose.

In the second place, I shall examine how nearly the motion of the Ganges agrees with what is deduced from these rules; and having thus proved them to be applicable to streams of all dimensions, I shall calculate the degree of velocity that may be expected in the proposed canal, and conclude with some remarks on the present state of the communication between the river and lake.

Major Rennell was aware that the current of the Ganges did not derive its velocity from the fall of its surface: he says, "When we consider that the velocity of the Ganges is 3 miles in one season, and five or more in another, on the same descent of 4 inches in the mile; and the motion of the inundation is only half a mile an hour on a much greater descent," (9 inches,) "no farther proof is required how small the proportion of velocity is that the descent communicates."

That the velocity in the current of rivers and canals depends upon other circumstances than the mere slope of their surfaces, is evident from the following fact, obtained by direct experiment in Italy. The river Po, which has a slope of 6 inches in the mile, has during a fresh, a velocity of 31 miles per hour; whilst the Rheno, a river which flows into the Adriatic 40 miles south of the Po, with a fall of 15 inches per mile, has, during a similar fresh, a rate of only 25 miles per hour.

When Major Rennell's Memoir was written, from which I have extracted the foregoing quotation, the theory of the motion of rivers was but imperfectly known. That of Guglielmini was in the greatest repute; but it was found to be at so much variance with experiment, that it was treated as a mere philosophical speculation, by practical men, who were left to draw their conclusion, either from vague conjecture, or from observing existing works, which applied nearest to those they were about to undertake.

In the year 1786, five years after Rennell's account of the Ganges and the Berhampootur rivers appeared in the Philosophical Transactions, the Chevalier de Buat published the result of his numerous experiments, made by order of the French Government, on the motion of water in conduit pipes and open canals. From these experiments he obtained the following general formula, which agreed in the most surprizing manner with the facts he had collected, and which has been found applicable to every case of water in motion, viz.

$$V = \frac{(307\sqrt{d} - 0{\cdot}1)}{\sqrt{S.} - \text{Hyp. Log.}(\sqrt{d} + 1.6)} - 0{\cdot}3(\sqrt{d.} - 0{\cdot}1)$$

Where V is the mean velocity in inches in a second of time.

d. The Hydraulic mean depth in inches, or, the area of the section of the stream divided by the perimeter of the surface of the ground in contact with the water.

S. The fall, or height of any portion of the stream divided by the difference of height of the two extremities. It is the denominator of a fraction whose numerator is unity.

From this formula it will be seen, that the velocity of large rivers, in which the depths bear a very small proportion to the breadths, is nearly as the square roots of the depths,* when the fall is the same, and as the square roots of the fall, when the depth are the same, or, the velocities of large rivers are in the compound ratio of the square roots of their depths, and fall.

* In rivers of this description, the hydraulic mean depth used in the formula is so nearly equal to the real depth, that it may be employed without producing any very sensible error in the result. For by the definition $D = \frac{bd}{b+2d}$ and if $d$ is infinitely small in comparison with $b$, the equation becomes $D = \frac{bd}{d}$ or $D = d$. That is, the hydraulic mean depth is then equal to the real depth of the river. For instance, in the first of the following calculations of the velocity of the Ganges, the hydraulic mean depth differs from the real depth, only four inches

Major Rennell accounts for the great increase in the velocity of the Ganges in the rainy months, in the following manner: "It is then, to the impetus originating at the spring head, or at the place where adventitious waters are poured in, and successively communicated to every part of the stream, that we are principally to attribute the velocity; which is greater or less according to the quantity poured in."

When this opinion was formed, as I have before remarked, Major Rennell must have been unacquainted with the results of the Chevalier de Buat's experiments, which prove, that the increase of velocity is, in the case of the Ganges, solely caused by an increase of depth, and can in no wise be affected by any foreign impetus, as he supposes. In proof of this assertion, I subjoin the velocity of the Ganges, calculated from Buat's formula both for the dry and rainy seasons; adding also that of the inundation. The near agreement of these with the phenomena that actually take place must afford to every one a striking proof of its accuracy, and in the case of the inundation, must shew, in the strongest light, what I before pointed out, viz. that the velocity of rivers does not entirely depend on their fall. For, with a fall double that of the Ganges, we find, in the case of the inundation, other circumstances, which need not be mentioned here, operate in reducing the velocity to one-fourth.

Supposing the Ganges in the dry season to be 1½ miles broad, and 30 feet deep, with a fall of four inches in the mile; we get D=360 inches, $S=\frac{1}{15840}$, which gives a velocity of 2.35 miles per hour, or upwards of two miles and a quarter (*a*).

Now in the rains, we suppose the fall, from its shorter course, to be 5 inches, its breadth to be 3 miles, and mean depth 70 feet. Following the proportion before laid down, we obtain a velocity of 4.15 miles per hour, or nearly four and a quarter (*b*).

Again, supposing the inundation that Rennell speaks of to be 4 feet deep, and the fall 9 inches in the mile, we get a velocity of 1.28, or a little more than a mile and a quarter (*c*).

Or, if it be only one foot deep, the velocity of the inundation will amount to only 66, or about half a mile per hour (*d*).

(*a*) $\sqrt{d}=19{\cdot}0$
$\sqrt{s}=125{\cdot}9$
$V=\frac{307\ (18{\cdot}9)}{125{\cdot}9\ \text{Com. Log.}\ (127{\cdot}4\times2{\cdot}3} - 0{\cdot}3\ (18{\cdot}8)$
V = 41·6 inches per second.
V = 2·35 miles per hour.

(*b*) $\sqrt{30\times4} : \sqrt{70\times5} :: 2{\cdot}35 : 4{\cdot}15$

(*c*) $\sqrt{30\times4} : \sqrt{4\times9} :: 2{\cdot}35 : 1{\cdot}28$

(*d*) $\sqrt{30\times4} : \sqrt{1\times9} :: 2{\cdot}35 : 0{\cdot}66$.

All these rates agree very nearly with experiment, and with what I have myself observed in navigating the Ganges at various seasons of the year. These examples will, I trust, be sufficient to establish the accuracy of the above mentioned formula in every case.

In hopes therefore that what I have now said will remove the idea, that an increased fall must necessarily give a moving body of water a proportionate increase of velocity, I shall dismiss the subject for the present, and proceed to examine the fall and velocity that may be expected to take place in the canal;—and first, for the dry season.

We will first suppose (which will be more fully considered hereafter) that the tide from the river disembogues into the lake a mile to the eastward of Ballia Ghaut. From Mr. Kyd's observations on the tides, and the levels of Calcutta, it appears, that from October to June, the highest tide does not rise 8 feet above the level of the lake in the same season.—From the river at Chitpoor, along the proposed line of the canal, to the above-mentioned point in the lake is 7 miles; consequently, if we allow that the surface of the canal will assume an uniform slope from the river to the lake, the fall will be about 14 inches in the mile. Now supposing the canal to have a breadth of 80 feet at the surface, and a depth of 20 feet, we get from the above theorem a velocity of 3 miles an hour (*e*).

(*e*) $\sqrt{d}=15{\cdot}5$
$\sqrt{s}=68{\cdot}5$
V = 51·[illegible] inches per second
V = 2·[illegible] miles per hour

This is the utmost velocity therefore, that the stream will have in the dry months Its mean velocity may be taken at $2\frac{1}{4}$ miles at high water.

The Hoogly seldom falls 6 feet below the surface of the lake in the dry season. The velocity of the ebb, from the lake to the river, by following the same method of calculation, will be found to be about a mile and a quarter in the hour (*f*).

(*f*) $\sqrt{d}=6{\cdot}8$
$\sqrt{s}=89$
V=22·7 inches per second.
V =1·3 miles per hour
Breadth 80 feet.
Depth 20 feet.

In the rains, the Hoogly rises upwards of 12 feet above the surface of the lake. Allowing the distance which the water has to flow into the lake to be the same as before, its velocity, by calculation, will amount to $3\frac{3}{4}$ miles per hour, at the highest tide ; or on an average, at the spring tides in the rains, $3\frac{1}{2}$ miles an hour (*g*).

(*g*) $\sqrt{d}=11{\cdot}9$.
$\sqrt{s}=57$.
V=65 inches per second.
V—3·71 miles per hour.
Breadth at surface 90 feet.
Depth 25 feet.

To ascertain still further the degree of reliance that might be placed on these calculations, I observed the fall and velocity of Tolly's Nullah The former I found to be 11 inches in the mile, and the latter at the surface 2.5 miles per hour. Now to compare this velocity with the calculated velocity, we have,

A. The area of the Section of the Nullah, 1260 feet.

P. The Perimeter of the part in contact with the water, 120 feet.

S. The fall, $\frac{1}{5760}$

These dimensions give a mean velocity of 27 miles, (*h*) or a superficial velocity of 3.0 miles per hour ; making a difference between the observed and calculated rate of .5, or half a mile an hour. This may be accounted for, from the obstruction the stream meets with in passing under the bridges, particularly under that at Kidderpore.

(*h*) $\sqrt{d}=11{\cdot}9$
$\sqrt{s}=76$
V—48 inches per second.
V = 2·7 miles per hour.

By deducting the difference that is found to take place between the observed, and calculated velocity of Tolly's Nullah, from the calculated velocity of the canal, we shall obtain, without much chance of error, a very near approximation to the greatest velocity which the canal will have at its surface ; or $2\frac{1}{4}$ miles in the dry season, and $3\frac{2}{5}$ miles in the rains. From the former velocity, I should apprehend little danger either to the bridges or to the sides of the canal ; but very reasonable fears may be entertained of the inability of the bridges to withstand the force of the latter. It is therefore my opinion (founded on this consideration alone), that the communication between the river and lake should be obstructed during the rains.

The chief objection, however, to keeping open the canal throughout the year, is the entire stoppage that would occur to the drainage of the greater part of the town during the rains. For instance, at Ooltadanga, the surface of the Circular Road is 11 feet above that of the lake in the rains. Now, the highest tide in the dry weather which rises in the river 8 feet above the lake, will give a height to the surface of the canal, at this place, of 7 feet above the lake ; consequently the water in the canal will be 4 feet below the level of the road at the highest spring tide. It seldom, however, rises 6 feet above the lake at spring tides. In the rains, on the contrary, the surface of the water in the canal at this place, will be $1\frac{1}{2}$ feet *above* the level of the road at high water ; and as the river at that season does not frequently fall 10 feet, there will be no possibility of draining this part of the town into the canal, if the river flows into it. At the eastern extremity of the Bow Bazar Street, the highest rise of the tide in the canal will be nearly on a level with the bottom of the ditch in the dry season. In the rains, it will be on a level with the road. At the eastern end of the Durrumtollah, the surface of the canal will be depressed about a foot below the last mentioned heights.

Another objection to keeping open the communication between the river and lake in the rains, which appears to me to be little inferior in point of importance to the two I have already mentioned, is the great quantity of sand that would be poured into the canal from the river at that season. Some idea may be formed of it when I state the fact, that in the rains the stream carries with it one-fourth of its bulk of sand. I build the stability of the other canals entirely on their not being exposed to the freshes of the river. It is only from these, and the matter they carry with them, that any danger to the success of the scheme is to be dreaded. To guard against their destructive effects is the grand object in similar works, in every country where they have been planned.

In the rains, a communication between the river and lake will not, I should think, be required, as there are then so many other passages open. But the canal might be used as a safe retreat for boats, from the dangers of the Hoogly, by placing the sluice at some distance from the mouth of the canal. The bridge at the Ooltadanga road might be fixed upon for this, without endangering the drainage of the northern part of the town ; and the interjacent portion of the canal, with the harbours, from the river to the sluice, would then be sufficiently capacious for the craft that might take advantage of it.

The comparative unhealthiness of the suburbs, a fact well attested by every medical practitioner in Calcutta, has been generally assigned to the proximity of the lake. It has in consequence been the fashion, probably from the first establishment of the settlement, to expatiate on the salubrity that the atmosphere of the city would acquire, from draining and cultivating its bed. Much therefore may now be expected to be heard on the subject ; yet, how desirable soever the accomplishment of this object may be, it ought not, in my opinion, to be precipitately undertaken. The importance of so low a level in the immediate vicinity of the town, should be maturely weighed and considered

The lake, under proper management, so far from being injurious to the city, would become one of its greatest local advantages. If we except its noxious exhalations (a point to be hereafter examined), we cannot but admit its present benefit. Without it, the greater part of the town would be under water during three months in the year. It acts as a receptacle for the rain which falls on the surface of the town ; sufficiently near for its immediate removal, and at the same time so capacious, as to hold what is admitted without rising in level, being leisurely and imperceptibly drained off into the Soondurbund passages. Without it, many of the most populous streets, after a heavy fall of rain, would be 3 feet under water ; and it might so happen, that in some there would be a depth of water beyond an ordinary man's stature.

The effect of the canal on the lake will, I expect, be that of raising its surface a few inches higher than it now stands, at the distance of a mile to the eastward of Ballia Ghaut, during the dry season ; in which case, it may be made to cover the same surface of ground at every state of the tide ; and by this, noxious exhalations arising from the action of the sun on the humid ground, now left exposed by the retiring of the tide, (which exhalations are I believe alone accounted unhealthy,) would be effectually remedied ; and if two of the bunds, for this purpose, be carried in a parallel direction towards Dum-Dum, a communication for small boats with Calcutta might, in this manner, be established at no additional expense. The acquisition of land can be an object of no consideration, for we see a large tract on the eastern side of the lake left uncultivated, that requires no other exertion to bring it into cultivation, than raising a bund a foot high, and clearing the jungle at an expense of two rupees a beegah.

I shall here bring forward the observations I have collected on the existing communication between the river and lake. As the accuracy of the conclusions drawn from them must entirely depend on that of the levels, I shall first of all endeavour to shew that these have been proved in such a manner as cannot leave a doubt on the minds of such as are acquainted with the operation. When only a single series of levels have been taken between any two points, the true difference of level of the points may be fairly doubted ; but if the series is repeated by levelling either directly back to the first place, or circuitously, and the same height of the first place that was assumed at starting is obtained on returning, the subject admits of no further question. One or the other of these methods I have invariably followed, but more generally the latter, as I thereby obtained not only the proof of a former level, but the levels of other streets at the same time. A careful examination of the field books* of levels taken by me under the superintendence of the Lottery Committee, where the errors that really exist in the work are put down in the plans, and where the calculations and protractions were made by another hand, will, I trust, be sufficient to set the matter at rest, and remove any impression that may hitherto have prevailed of the difference of level between the river and lake, being otherwise than I have stated. I should not have made this so immediately a point of discussion, had I not heard the accuracy of the levels disputed. If, however, after what I have said, any doubt should still remain, it can easily be removed by levelling up the Durrumtullah from Chandpaul Ghaut to the head of the Eastern Canal, at the back of the Circular Road in Entallee. This could be effected with ease in a few hours ; and I should be happy to undertake it conjointly with any who might wish to witness the result.

The only direct communication between the river and lake at present, is by the Marhatta Ditch from Chitpore to Saum Bazar bridge, and the ditch on the side of the Dum-Dum road to the head of the lake at the two bridges, near Saum-nuggur. This line I levelled in company with Captain Jackson, deputy assistant quarter master general, and found the difference of level between the highest rise of the river and the lake in the rains, to agree within three inches of what I had before found it to be by levelling from Chandpaul Ghaut to the Eastern Canal

Expecting a high tide to take place on the 14th August last, I went to Chitpore, and with the assistance of Captain Morrieson, assistant quarter master general, I made the observations contained in the accompanying plan, the abstract of which is as follows :—On that day, the tide rose 9 feet 6 inches above the level of the lake at Chitpore ; 6 feet 10 inches at the bridge crossing the Mahratta Ditch at Saum Bazar ; and 3 feet at a small bridge over the Dum-Dum road ditch, which is 3150 feet from the Saum Bazar bridge. The difference of level, therefore, between the river and Saum Bazar bridge, was 2 feet 8 inches, in a distance of 3400 feet ; or 3 feet 9 inches in the mile ; whilst the latter gives a fall of 3 feet 10 inches in 3150 feet or 5 feet 6 inches in the mile. The observed rate of the stream was $1\frac{3}{4}$ miles per hour. The slowness of this motion, to what might have been expected from the quantity of fall, can be accounted for, only from the obstruction the stream meets with in its passage under the numerous contracted arches that are thrown over the ditch ; at each of which there is a fall visibly abrupt.

* In the field books of levels, here referred to, the following note has been added to the page containing the explanation of the manner in which the levels were taken "Note. Since the above remarks were written, it has been found from observation that the water in the Lake or at the head of the Eastern Canal is not raised higher by the rains than 10 inches. The base line is therefore 3 feet above the level of the Lakes in the dry season, and two feet above it in the rains." [11th March, 1840.]

Before I conclude these remarks, it will be necessary to take some further notice of the nature of the soil along the line of the proposed canals, and the method before alluded to, of damming up the canal at the back of the Circular Road during the rains. Along the whole line, I apprehend it will vary inconsiderably from what it is found to be in the vicinity of Calcutta, to the depth that the excavations are likely to be carried. I am led to this opinion, from the circumstance of a similar stratum of sand having been found at the same depth as at Calcutta, in the cut made by Lieutenant Morrieson, or at about 17 feet below the general level of the country. The following table of the different strata near Calcutta, was communicated to me by Mr. Jones, who had, I believe, much experience on these subjects.

| | | | | |
|---|---|---|---|---|
| " From the surface to 13 feet, common earth, | .... | Thickness, | 13 | feet |
| ,, | 13 feet to 17½ feet, sand if any, | ,, | 4½ | ,, |
| ,, | 17½ feet to 23 feet, sand and blue clay, | ,, | 5½ | ,, |
| ,, | 23 feet to 24½ feet, peat or turf, | ,, | 1½ | ,, |
| ,, | 24½ feet to 35½ feet, blue clay, | ,, | 11 | ,, |
| ,, | 35½ feet to 38½ feet, ditto softer, | ,, | 3 | ,, |
| ,, | 38½ feet to 68½ feet, strong blue clay, | ,, | 30 | ,, |
| ,, | 68½ feet to 69½ feet, kunker and clay, | ,, | 1½ | ,, |
| ,, | 69½ feet to 70 feet, yellow ochre, | ,, | ½ | ,, |

" At 38½ feet, trees are usually found in a perfect state,

" At 70 feet, through a stratum of red coarse sand, issues a spring, which is acted upon by the tides in the river."

From the above table I draw the following conclusions :—

That the canals can be deepened 13 feet, before water will ooze into them through the sandy layer*.

That the water can be kept out of the excavation, by cutting off the communication with the adjacent sandy stratum, by means of trenches 5 feet deep, filled with mud or clay. —Vide Plate 2, Figure 1.

That, in the event of the excavations being carried as low as this stratum in the canals beyond Calcutta, by letting in a stream, a further depth of 5 feet will be obtained at no expense. In the Soondurbund cut, before alluded to, the excavation was carried down to the surface of the sandy layer, which was immediately washed out of the cut, on admitting the stream.

That, provided there be no danger of forming a sand bank in the Hoogly at the mouth of the canal, the sand layer may in like manner be expelled from the Circular Road canal, by admitting a stream into it from the Salt Lake.

That, when this sand is cleared out, the banks will sink in, until the upper stratum of earth rests on that of blue clay, when they will no longer sink, or experience any further variation.

That, at a depth of 18 feet, there is a layer of soil, sufficiently compact and thick to bear masonry.

With regard to the method of damming up the Circular Canal in the rains, I have before observed, that if it is done near the Ooltadanga Road, a sufficient space will be left

* In excavating the new tank in the Durrumtullah, springs were found at a depth of 15 feet below the surface.

open with the river to admit the craft that would probably take advantage of the canal as a retreat from the Hoogly in stormy weather.

In the masonry of this bridge, which should have two arches to give a sufficient water-way, grooves should be constructed, for the reception of large saul or teak timbers ; each dam being composed of two piles of timbers, with the space between them filled up with earth.—Vide Plate 1, Figure 11.

For the sake of greater security, the dams might be doubled. The advantage of dams of this construction over flood-gates, I conceive to consist in their being more secure ; as they will not be deranged by any slight sinking of the piers, or irregularity of the bottom,—whereas flood-gates not only require the most scrupulous adjustment of their parts, but a degree of evenness of floor, which can hardly be expected in a bed washed by a rapid stream, without intermission, during nine months in the year.

The original expense of their construction will also be much less , as they can be placed in the masonry of a bridge, whilst flood-gates would require separate piers ; and the annual charge of fixing and removing them would be a mere trifle, in comparison with that of an establishment for the gates.

I have now, I believe, enumerated all the most prominent points of my plan which bear upon its practicability and local effects ; and have endeavoured to elucidate them in such a general manner, as I trust will leave little more for the Committee, in order to come to a decision on the main object, than to prove or disprove the assertions and conclusions I have brought forward. To detail minutely each particular part, would involve time and expense, beyond what I conceive the Committee might desire, and would be more properly a subject for one of superintendence, than of original inquiry as to feasibility. For this reason, I have purposely avoided any further mention of the number, description, and dimensions of the harbours and bridges, &c. I have confined myself chiefly to such particulars of the plan as I have heard objected to, or on which I think a difference of opinion likely to prevail. Some may perhaps have inadvertently escaped my notice. If so, I shall be happy to have them pointed out, and will do my best endeavours to advert to them, with such information as I may possess.

(*Signed*) J. A. SCHALCH, *Lieut.*
*Dy. Asst. Qr. Mr. Gl.*

CALCUTTA,
23*rd Sept.* 1821.

# D 1.

*Method employed to ascertain the Difference of Level between the Hoogly and Salt Lake.*

On the 9th June 1820, the tide rose at Chandpaul Ghaut to the height of a brick which was marked. On the same day it rose at Mr. Kyd's dock 15 feet 8 inches on his measure; consequently the brick answers to 15 feet 8 inches on his Gauge.

To prove this, observations were made on the two following days.

| | ft. in. | | ft. in. | | ft. in. |
|---|---|---|---|---|---|
| On the 10th, it rose | 0 5¼ | above the brick. At Mr. Kyd's it rose to | 16 2 | —diff. | 15 8 |
| ,, 11th, it rose | 0 5 | above the brick. At Mr. Kyd's it rose to | 16 5 | —diff. | 15 10 |

As there is little variation in the three days' observation, I have taken 15 feet 8 inches for the height of the brick on Mr. Kyd's gauge.

| | |
|---|---|
| The brick is above the line, I call the base line, of the levels ... | 3 ,, 10 |
| Consequently the base line of the levels answers on Mr. Kyd's gauge to | 11 ,, 10 |
| By Mr. Kyd's tide-book it appears, that from 1806 to 1813, the tide never exceeded ..................................................... | 22 ,, 4 |
| Therefore the highest rise of the Hoogly above the base line will be .. | 10 ,, 6 |
| On the 25th of August 1820, the surface of the water was below the outer ledge of the bridge, at the head of the Eastern Canal, .. | 11 ft. 0 in. |
| The ledge, by levelling from Chandpaul Ghaut up the Durrumtollah, and proved by levelling back, down the Bow Bazar Street, was found to be above the base line, .. | 9 ,, 3 |
| The surface of the lake in August was therefore below the base line. .. | 1 ,, 9 |
| On the same day the river rose on Mr Kyd's gauge ... | 22 ,, 3 |
| The base line agrees with .. | 11 ,, 10 |
| Therefore the tide on that day rose above the base line, .. | 10 ,, 5 |
| And as the surface of the lake stood below it, ... | 1 ,, 9 |
| The difference of level on that day was, ... | 12 ,, 2 |

The following springs to these, the river rose to its highest point, or 22 feet 4 inches, at Mr. Kyd's dock.

In August of this year (1821) it rose to 22 feet 3 inches.

NOTE.—The Municipal Committee do not think it necessary to Lithograph the Maps referred to as No. 2, and No. 3, in the paper marked A. The Table of Levels, and the depth and width of the Lake channel, &c., marked on the Map, No. 2, have been transferred to the Map No. 1.—Map No 2, is merely a Map of the Suburbs of Calcutta.—Map No. 3, is a Map of the country through which the proposed Canals are to be carried; shewing their direction and extent; and is similar, nearly in every respect, to Map No. 1; and like it, contains a Map of the Delta of the Ganges.

The originals of the Maps above referred to are lodged in the Office of the Military Board.—J. M.

# PART OF THE PAPER MARKED A.

Paper marked A. page viii. top line, dele the words "[Estimating the expense" down to the figures "Sa. Rs 1,65,650]" and insert the following —

"In drawing up the following Estimate of the expense likely to be incurred in carrying into execution the present scheme, I have been guided in the principal article, that of excavating the Canals, by the Calcutta rates of Tank digging; which are 1 Rupee 2 ans. for the upper cube of 9 feet;—1 Rupee 11 ans. for the cube of the second layer;—and 2 Rs. 8 ans. for that in the third. The present value of land has been obtained from personal inquiry; and there is no reason to suppose that any considerable advance will be made in it, when the purpose for which it is wanted shall be made public; at all events, by averaging it so high as 60 Rs. a cottah, ample allowance must be made for every contingency on this article.

ESTIMATE.

| | |
|---|---|
| Clearing the jungle from the banks of the Bytaghatta Khaul at the established rate of 2 Rs. per biggah, or, as the jungle seldom exceeds 20 feet in breadth, for every 720 running feet, for 84 furlongs. .. | 77 |
| Forming a tracking path of 15,840 feet along one side of the Bytaghatta Khaul, estimated at 1 Rupee for every 50 running feet. .. .. | 317 |
| Sloping the bank of the narrow part,—estimating the expense as that for digging a cube of 9 feet for 1 Rupee—for 2 miles. .. .. .. | 1,300 |
| Clearing 5 miles of brushwood from the Bungurria Khaul as above. .. | 1,000 |
| Excavating the Canal between the Nuzzerpoor Khaul and the Colbaduck River. .. .. .. .. .. .. .. .. .. | 12,179 |
| Cost of 41 biggahs of land, required for the Canal, at 10 Rs. per biggah. .. | 410 |
| Excavating the Narolee Canal, including ground. .. .. .. .. | 6,202 |
| Ditto the Canal between Husseinabad and Bussera. .. .. .. | 1,00,583 |
| Cost of 322 biggahs of land. .. .. .. .. .. .. .. | 3,200 |
| Clearing the jungle from both banks of the Koosree Khaul, 5 miles. .. | 74 |
| Deepening the same Khaul from E. to F. .. .. .. .. ... | 3,208 |
| Excavating the Canal to Narainpore, or from F to G, including the cost of land. .. .. .. .. .. .. .. .. .. | 33,029 |
| Bunding on the Bedadoory. .. .. .. .. .. .. .. | 9,124 |
| Bunding on the channel through the Lake and widening it 20 feet. .. | 2,000 |
| Deepening the passage from L to M and widening it to 70 feet. .. .. | 5,411 |
| Deepening the Eastern Canal. .. .. .. .. .. .. .. | 9,976 |
| Excavating the Canal from the head of the Durrumtollah to the River at Chitpoor. .. .. .. .. .. .. .. .. | 1,23,350 |
| Cost of 190 biggahs of ground for the Canal, at 60 Rs. per cottah. .. .. | 2,28,000 |
| Carried over, Total, .. Sa. Rs. | 5,39,440 |

* Note.—This matter, which has been taken from the original M. S. copy of Lieut. Schalch's Memoir, is not contained in the printed Memoir from which the Memoir at page i. to xiv., inclusive, has been printed. —J. M.

| | |
|---|---|
| Brought forward, .. .. .. | 5,39,440 |
| Cost of 40 biggahs of ditto for a road along the Calcutta side of the Canal 30 feet broad. .. .. .. .. .. .. .. .. | 48,000 |
| For 3 bridges ;—1 over the Chitpoor road ; another over the Dum-Dum road ; and a third over the Manickpoor road. .. .. .. .. | 60,000 |
| Interest on the above Sum for half the time the work is performing ; or for $1\frac{1}{2}$ years @ 6 per cent. .. .. .. .. .. .. .. .. | 56,828 |
| For 3 years interest at 6 per cent, on Rs. 2,28,000 for the money laid out in the purchase of land on the bank of the Canal to be resold. .. .. | 41,040 |
| Total, ... | 8,45,309* |
| Expense of the Canal from Deacol to Husseinabad. .. .. .. | 60,000 |
| Ditto, of two additional bridges. .. .. .. .. .. .. | 40,000 |
| Grand Total, .. †Sa. Rs. | 9,45,309" |

* Sic in Original. J. M.

"The figures scattered over the Map, in the direction of the Circular Canal, denote the value of the ground at those places. If therefore a breadth of 150 feet be bought on the Calcutta side, independent of what is required for the Canal and road, before the work is commenced, on the opening of the Canal its value will be greatly enhanced.

The land for instance on the banks of the Eastern Canal now realizes between 300 and 400 Rs. a cottah, which was bought, before the formation of the Canal, for 16 and 20 Rs. We may, therefore, conclude, that the ground contiguous to the proposed Circular Canal, will, on its being opened, become of equal value. If, however, it should only sell for 280 Rs. a cottah, there will be a gain of 220 Rs. on each cottah, or 9,06,400 on the whole :—which of itself very nearly defrays the expense of the undertaking.

Paper marked A. page viii., line 19 from top, after the words "proportionally augment," insert—

The expense having been nearly repaid by the resale of land,—the yearly receipt from

| | |
|---|---|
| Toll on boats passing may be estimated at .. .. .. .. .. | 80,000 |
| And from boats lying in the harbours, .. .. .. .. .. | 75,281 |
| Total, .. | 1,55,281 |
| Deduct for repairs and establishment, .. .. .. .. .. .. | 35,000 |
| Yearly profit, Rs. | 1,20,281 |

or about $14\frac{1}{2}$ per cent. on the sum advanced after the principal has been repaid."

† This does not include the charge for Superintendence and other Contingencies estimated at Rs. 100,000—Vide para. 59 of the paper marked E.—J. M.

# E

[ *Report dated 28th October, 1822, and connected papers, of the Committee appointed to examine Lieut. J. A. Schalch's plan.* ]

Territorial Department Revenue, Consultation,
*20th March* 1823, *Nos.* 40 *and* 41.

TO H. MACKENZIE, ESQ.
*Secretary to Government in the Territorial Department.*

No. 167.

SIR,

1. Having, in pursuance of instructions communicated from your Department, under date the 28th July 1821, proceeded to consider the means best calculated to meet the object and intentions of Government, we determined, in the first instance, that Lieutenant Schalch's Memoir should be carefully revised and printed,(1) with a view to reduce this Document to a size convenient for its distribution to the several persons who might be called on by the Committee to afford information, or to express their opinion on the merits of the proposed line of Canals.

(1) Vide paper marked E 3

2. At the same time Lieutenant Schalch was requested to demonstrate the principles on which he had deduced the velocity(2) of rivers, and further to explain other points adverted to in his Memoir; the results are contained in the Second(3) Appendix; to which we beg to draw the particular attention of Government, and to express our opinion, that, the points to which it adverts, are both ably and satisfactorily treated. In the course of our inquiries, no grounds have arisen to impugn the correctness of the conclusions, deduced by Lieutenant Schalch.

(2) Vide paper marked A. page vii. line 18.
(3) Vide paper marked D.

3. Having taken these preliminary steps, the next object of our attention was to class(4) the subjects of investigation under different heads, in order to simplify the labours of the Committee; with this view the inquiry was divided into the following branches:—viz,

(4) Vide paper marked E 3.

First,(5)—References on general principles, practicability, &c. of Lieutenant Schalch's proposition.

(5) Vide paper marked E 4 *d.*

Second,(6)—On the influence of the proposed Canal on the accommodation and Drainage of the city of Calcutta, and on the probable cost of land, per cottah, from the Eastern Canal to the River Hooghly near Chitpore.

(6) Vide paper marked E. 4. *e.*

Third,(7)—On the navigation through the Sunderbuns, obstacles, advantages, &c. &c.

(7) Vide paper marked E. 4. *f.*

Fourth,(8)—On the present navigation between Calcutta and the Ganges by the Hooghly, Mattabangha, Baugrutty, and Jellinghy Rivers.

(8) Vide paper marked E. 4. *g.*

Fifth,(9)—On the nature and extent of the Trade likely to come within the influence of the new line of navigation to the Eastern and Western provinces.

(9) Vide paper marked E. 4. *h.*

Sixth,(10)—On the mercantile advantages expected to result from the adoption of Lieutenant Schalch's propositions.

(10) Vide paper marked E 4 *i.*

4. Under these several heads, Lists of Queries were arranged for distribution.

| | | | |
|---|---|---|---|
| List(11) | No. 1 | of 9 | Questions. |
| Ditto,(12) | ,, 2 | ditto 11 | ditto, |
| Ditto,(13) | ,, 3 | ditto 28 | ditto, |
| Ditto,(14) | ,, 4 | ditto 27 | ditto, |
| Ditto,(15) | ,, 5 | ditto 21 | ditto, |
| Ditto,(16) | ,, 6 | ditto 10 | ditto. |

(11) Vide paper marked E 4. *d.*
(12) Vide paper marked E. 4. *e.*
(13) Vide paper marked E. 4. *f.*
(14) Vide paper marked E. 4. *g.*
(15) Vide paper marked E. 4. *h*
(16) Vide paper marked E. 4. *i*

5. These measures were not completed before the end of November 1821; but, during their progress, the Committee had turned their attention to the state of the existing navigation through Tolly's Nullah; and, on the information obtained, submitted to the consideration of Government, a proposition[1] for employing Lieutenant Schalch in removing the obstructions throughout this channel; the sanction[2] of Government was given to this recommendation.

(1) Vide paper marked E. 7.
(2) Vide paper marked E. 9.

6. During the months of December 1821, and January 1822, were completed and distributed copies of Lieutenant Schalch's Memoir, with the Lists of Queries for the several persons from whom information appeared obtainable. The subjoined List will evince the anxiety of the Committee fully to investigate the subjects submitted to their consideration, and to collect a complete body of information on every branch of the inquiry:— *Viz*

| | | | |
|---|---|---|---|
| List, **No. 1** | To | Major General Hardwick, *Commandant Artillery.* | |
| Ditto, | ,, | Lieutenant Colonel Mouat, *Chief Engineer.* | |
| Ditto, | ,, | [3]Captain Hodgson, *Surveyor General.* | (3) Vide paper marked E. 13 |
| Ditto, | ,, | Lieutenant Colonel T. Wood, *Engineers* | |
| Ditto, | ,, | [4]Mr. James Kyd, | (4) Vide paper marked E. 15. and E. 15. a to E. 15 c inclusive. |
| Ditto, | ,, | [5]Mr. Bleychenden, | (5) Vide paper marked E. 14. & E. 14 a |
| Ditto, | ,, | Lieutenant Colonel Pailby, *Engineers.* | |
| Ditto, | ,, | [6]Major J. L. Stuart, *Superintendent Telegraphs* | (6) Vide paper marked E. 38. & E. 38. a. |
| Ditto, | ,, | [7]Major Phipps, *Superintendent Military Buildings* | (7) Vide paper marked E. 16. |
| Ditto, | ,, | [8]Lieutenant Charles Paton, *Assistant ditto ditto.* | (8) Vide paper marked E. 12. |
| List, **No. 2** | ,, | [9]Lottery Committee. | (9) Vide paper marked E. 43 |
| Ditto, | ,, | [10]Mr. Bleychenden, | (10) Vide paper marked E. 14. & E. 14. a. |
| Ditto, | ,, | [11]Mr. James Kyd. | (11) Vide paper marked E. 15 & E. 15 a. to E. 15 c. inclusive |
| Ditto, | ,, | W. C. Blacquiere, Esq. | |
| Ditto | ,, | [12]D. C. Smith, Esq | (12) Vide paper marked E. 33. |
| Ditto, | ,, | [13]Major Phipps *Superintendent Public Buildings* | (13) Vide paper marked E. 16. |
| List, **No. 3** | ,, | Judge and Magistrate, 24 *Purgunnahs* | |
| Ditto. | ,, | [14]Ditto, ditto, *Jessore.* | (14) Vide paper marked E. 18. |
| Ditto, | ,, | Ditto, ditto, *Backurgunge* | |
| Ditto, | ,, | [15]Collector of *Jessore.* | (15) Vide paper marked E. 46. |
| Ditto, | ,, | [16]Ditto, ditto, *Backurgunge.* | (16) Vide paper marked E. 41 & E. 41 a |
| Ditto, | ,, | Salt Agent 24 *Purgunnahs.* | |
| Ditto, | ,, | [17]Assistant ditto, ditto. | (17) Vide paper marked E. 21. & E. 21 a & E. 21 b |
| Ditto, | ,, | Salt Agent, *Western Division,* ditto. | |
| Ditto, | ,, | [18]Ditto ditto, *Bulloah and Chittagong.* | (18) Vide paper marked E. 22 & E. 22. a |
| Ditto, | ,, | [19]Commissioners in the *Sunderbuns.* | (19) Vide paper marked E. 44. & E. 44. a. |
| Ditto, | ,, | Collector of Government Customs, *Dacca.* | |
| Ditto, | ,, | [20]Ditto ditto, *Chittagong.* | (20) Vide paper marked E. 40 |
| Ditto, | ,, | [21]Mr. J. Fraser, *Superintendent Embankments, Commercolly.* | (21) Vide paper marked E. 17. |
| Ditto, | ,, | [22]Mr. L. Betts, ditto ditto 24 *Purgunnahs.* | (22) Vide paper marked E. 27 |
| Ditto, | ,, | Mr. Lambe, *Civil Assistant Surgeon, Dacca* | |
| Ditto, | ,, | [23]Captain Davidson, *Chunam Agent, Sylhet.* | (23) Vide paper marked E. 49. & E. 49. a. |
| Ditto, | ,, | [24]Henry Matthew, Esq. *Secretary, River Insurance Company.* | (24) Vide paper marked E. 20. & E. 20. a. |
| Ditto, | ,, | Mr. John Carter, *Merchant, Dacca.* | |

| Note | List | | To |
|---|---|---|---|
| (1) Vide paper marked E. 19. & E. 19 *a.* | List, **No. 3** | To | [1]Mr. Woodin, *Boat Agent, Dacca.* |
| (2) Vide paper marked E. 34. | Ditto, | ,, | [2]Mr. George Boyd, *Indigo Manufacturer, Pubna.* |
| | List, **No. 4** | ,, | Lieutenant Colonel Pailby, Esq. *Engineer, Moorshedabad.* |
| | Ditto, | ,, | Committee of Embankments, *ditto.* |
| | Ditto, | ,, | Ditto ditto, *Nuddeah.* |
| | Ditto, | ,, | Commercial Resident, *Cossimbazar.* |
| (3) Vide paper marked E. 45. | Ditto, | ,, | [3]Ditto ditto, *Jungypoor.* |
| | Ditto, | ,, | Ditto ditto, *Commercolly.* |
| (4) Vide paper marked E. 36. | Ditto, | ,, | [4]Ditto ditto, *Bauleah.* |
| (5) Vide paper marked E. 47. | Ditto, | ,, | [5]Ditto ditto, *Maldah.* |
| | Ditto, | ,, | Ditto ditto, *Rungpoor.* |
| (6) Vide paper marked E. 23. | Ditto, | ,, | [6]Ditto ditto, *Soonamooky.* |
| (7) Vide paper marked E. 39. | Ditto, | ,, | [7]Ditto ditto, *Sudah.* |
| | Ditto, | ,, | Judge and Magistrate, *Nuddeah.* |
| | Ditto, | ,, | Collector, *ditto.* |
| (8) Vide paper marked E. 24. & E. 24. *a* | Ditto, | ,, | [8]Ditto of Government Customs, *Moorshedabad.* |
| | Ditto, | ,, | Mr. R. C. Blunt, *Indigo Manufacturer, Shekanpoor.* |
| | Ditto, | ,, | Mr. Harris, *ditto Kishnagur.* |
| | Ditto, | ,, | Mr. Faddy, *ditto Bansburiah.* |
| | Ditto, | ,, | Mr. Clark, *ditto Bogwangola.* |
| | Ditto, | ,, | Mr Savi, *ditto Coolbariah.* |
| (9) Vide paper marked E. 25. | Ditto, | ,, | [9]Mr. Birch, *ditto Jungypoor.* |
| (10) Vide paper marked E. 26. | Ditto, | ,, | [10]Mr. Barnes, *ditto Coostee.* |
| (11) Vide paper marked E. 20. *b.* | Ditto, | ,, | [11]Secretary, *River Insurance Company.* |
| (12) Vide paper marked E. 42. & E. 42. *a.* to 42. *c.* inclusive. | Ditto, | ,, | [12]Mr. J. S. May, *Superintendent Nuddeah Rivers.* |
| | Ditto, | ,, | Mr. J. Watson, *Indigo Manufacturer, Furreedpoor.* |
| | Ditto, | ,, | C. K. Robinson, Esq. *Calcutta.* |
| | List, **No. 5** | ,, | Collector Government Customs, *Calcutta.* |
| (13) Vide paper marked E. 35. & E 35. *a.* to E. 35. *f.* inclusive. | Ditto, | ,, | [13]Ditto ditto, 24 *Purgunnahs.* |
| | Ditto, | ,, | Ditto ditto, *Nuddeah.* |
| | Ditto, | ,, | Ditto of Government Customs, *Moorshedabad.* |
| | Ditto, | ,, | Commercial Resident, *Cossimbazar.* |
| (14) Vide paper marked E. 45. *b* | Ditto, | ,, | [14]Ditto ditto, *Jungypoor.* |
| | Ditto, | ,, | Ditto ditto. *Commercolly.* |
| (15) Vide paper marked E. 28. | Ditto, | ,, | [15]Ditto ditto, *Sonamooky.* |
| (16) Vide paper marked E. 36. | Ditto, | ,, | [16]Ditto ditto, *Bauleah* |
| (17) Vide paper marked E. 47. & E. 47. *a.* | Ditto, | ,, | [17]Ditto ditto, *Maldah.* |
| | Ditto, | ,, | Ditto ditto, *Rungpoor.* |
| (18) Vide paper marked E. 39 | Ditto, | ,, | [18]Ditto ditto, *Surdah.* |
| (19) Vide paper marked E. 42 *c.* | Ditto, | ,, | [19]Mr. J. S. May, *Superintendent Nuddeah Rivers.* |
| | Ditto, | ,, | Collector of Government Customs *Dacca.* |
| | Ditto, | ,, | Ditto, ditto, *Chittagong.* |
| (20) Vide paper marked E 21. *b.* | Ditto, | ,, | [20]Assistant Salt Agent, *Eastern Division,* 24 *Purgunnahs.* |
| | Ditto, | ,, | Salt Agent, *Western Division ditto.* |
| | Ditto, | ,, | Ditto, *Bulloah and Chittagong.* |
| | Ditto, | ,, | Ditto, *Eastern Division,* 24 *Purgunnahs.* |

List, **No. 5** To [1]Board of Trade. (1) Vide paper marked E. 29.
Ditto, „ [2]Ditto Customs, Salt, and Opium. (2) Vide paper marked E. 65. E. 65. *a.*
List, **No. 6** „ [3]Messrs. Stewart and Robertson. (3) Vide paper marked E. 31. & E. 31. *a.*
Ditto, „ Ditto Hogue, Davidson and Co.
Ditto, „ [4]Ditto Mercer and Co. (4) Vide paper marked E. 32.
Ditto, „ Ditto McClintock and Co.
Ditto, „ [5]D. Turnbull, Esq. (5) Vide paper marked E. 48. & E. 48. *a.*
Ditto, „ [6]A. Glass, Esq. (6) Vide paper marked E. 37.
Ditto, „ Lieutenant Charles Paton.
Ditto, „ [7]Henry Matthew, Esq. (7) Vide paper marked E. 20. *c.*
Ditto, „ Mr. J. Lambe, *Civil Assistant Surgeon, Dacca.*

7. After the issue of the several communications thus detailed, we suspended further proceedings pending the receipt of replies. Various communications having reached us, by the month of July last, a meeting was held to decide on the propriety of waiting for further information. After an attentive perusal of the documents, recorded in the proceedings of the 27th of July, it was resolved,[8] that the extent to which the inquiries had been carried warranted the preparation of a Report to Government; but, at the same time, keeping in view certain points on which further information might reasonably be expected. (8) Vide paper marked E. 64.

8. Having explained the plan adopted for realizing the wishes of Government, we proceed to review the whole subject under the six heads on which the lists of Queries were framed, making marginal references to the pages of our proceedings appended to this Report, which contain the replies and opinions of the individuals and bodies consulted on the points under discussion.

9. *First,*[9] On general principles, practicability, &c. of Lieutenant Schalch's plans. The able and clear manner in which this branch of the inquiry is discussed by Lieutenant Schalch in his Memoir[10] and 2nd Appendix,[11] and the decided approval of their late member, Captain D. McLeod, of the Engineers, who recorded[12] his opinions upon it before his departure for Europe, justifies the fullest reliance on the practicability of the undertaking. (9) Vide paper marked E. 1 *d.* (10) Vide paper marked A. (11) Vide paper marked D. (12) Vide paper marked E. 6.

10 On the velocity of streams, the correctness of the theory[13] advanced by Lieut. Schalch has in no instance been impugned. To the high authorities adduced in the Memoir, may be added the recent proof of the value of the Chevalier Du Buat's Formula, by its adoption in Dr. Brewster's Edinburgh Encyclopedia—the subject is discussed in the 14th volume of this work, page 289, under the article, Inland Navigation; it is also inserted in Rees' Cyclopedia, under the article, Rivers: although these articles were published at the time Lieutenant Schalch wrote his Memoir, it is a justice the Committee owe to the judgment and scientific research of that officer, to express their conviction, that, when the theory was applied to the velocity of Indian rivers, its general adoption by British authors was unknown to Lieutenant Schalch—and that he therefore has the merit of introducing it into practice in this country. (13) Vide paper marked D.

11. Captain Hodgson[14] surveyor general, Major Phipps[15] superintendent of buildings, Lieutenant Charles Paton,[16] assistant ditto, Major J. L. Stuart[17] superintendent of telegraphs, Mr. Dale[18] commissioner in the Sunderbuns, and Mr. James Kyd,[19] have severally recorded their opinions on the correctness of Lieutenant Schalch's reasonings, and on the practicability of the undertaking. The late Mr. Bleychenden was the only person who brought forward specific objections[20] to the proposed line of Canals; (14) Vide paper marked E. 13. (15) Vide paper marked E. 16. (16) Vide paper marked E 17. (17) Vide paper marked E. 38. & E. 38. *a.* (18) Vide paper marked E. 44. & E. 44. *a.* (19) Vide paper marked E. 15. & E. 15. *b.* to E. 15. *c.* inclusive. (20) Vide paper marked E. 14.

they were, however, only directed towards detached portions of the scheme, and not to its general practicability, on this, he did not entertain a doubt. Mr. B. suggested that the difficulties in crossing the Salt-Water Lake would raise the expenses of the undertaking far above the calculation in the Memoir, and proposed that a more circuitous route[1] should be resorted to. But the alteration proposed, of changing the direction of the Canal from Bamingotta, round the Dum-Dum cantonment, through Gourypoor, to join the River Hooghly at Barnagore, would completely defeat many of the most important and beneficial objects contemplated by Lieutenant Schalch.

(1) Vide paper marked E. 14.

Patient consideration of this subject has confirmed our judgment as to the superior advantages and comparative cheapness of the original scheme.

12. Before quitting this branch of the inquiry, we advert, in confirmation of the practicability of the plan, to the success which has attended similar works: viz. Goodlad's[2] Creek, excavated in the year 1796, and Morrieson's,[3] cut in the year 1813; these might have been considered experiments, and their success may be taken as convincing proofs of the practicability of Canals or cuts within the influence of tide waters. The small cost[4] of these undertakings support Lieutenant Schalch's calculations in that portion of the plan.

(2) Vide paper marked E 22. *a.* E 40. & E. 44. *a.*

(3) Vide paper marked E. 19 *a.* E. 40. E. 44. *a.* E. 53. & E. 53. *i.*

(4) Morrison's cut, upwards of ½ mile in length, 50 feet wide & 18 feet deep, cost 3,000 Rs. Vide paper marked E. 53. *c.*
On cost of Goodlad's creek. Vide paper marked E. 41. *a*

13. The Committee have before them a communication from Mr. Crommelin, Salt Agent at Hidgelee.—The existence of similar Canals on the Western side of the Hooghly, within the influence of the tides, strengthen the arguments in favor of the present Scheme: for more easy reference, Mr. Crommelin's tables of expense and profit of the Canals, in his Agency, are placed in the margin.[5] The Committee refer to the pages of their proceedings for that gentleman's sentiments on the general bearings of the subject.

(5) Table 1st, Vide paper marked E. 11

*Koonjopoor Khal*

| | | |
|---|---|---|
| | | Sa Rs |
| Collections by Tolls from 1809 to April, 1821.... .... .... | | 8,309 |
| *Charges* | | |
| Excavation, 10,199. Establishment, 1,756 | Sa. Rs. | 11,955 |
| Net loss to Government. | Sa Rs. | 3,646 |

Table 2nd, Vide paper marked E. 11.

*Narainpoor or Mirzapoor Khal*

| | | |
|---|---|---|
| Collections by Toll from 1809 to April 1821. .. | Sa. Rs. | 10,061 |
| *Charges* | | |
| Excavation, 3863, Establishment, 1861. | Sa. Rs. | 5,724 |
| Net gain to Government, | Sa. Rs. | 4337 |

14. The Committee solicit the attention of Government to an able Paper drawn up by Major Rennell[6] since his return to Europe, and they feel assured the arguments of this intelligent Geographer will be considered as setting at rest all doubts as to the superiority of Lieutenant Schalch's scheme over any more direct route to the Ganges. Major Rennell's Memoir could not be abridged without impairing its effect, while its length precludes us from inserting it in this Report

(6) Vide paper marked E 54. E. 55.

The Committee here close this branch of their inquiry, and proceed to the next subject of Investigation: viz.

15. *Secondly,*[7] On the influence of the proposed Canals on the accommodation and draining of the City of Calcutta, with the probable cost of land, per cottah, from the Eastern Canal to the River Hooghly near Chitpore.

(7) Vide paper marked E. 1. *e*

16. On this branch of the scheme the Committee are enabled to offer an opinion on some grounds, in as much as they have had the means of obtaining the sentiments of gentlemen whose acquirements and local knowledge qualify them to judge. Several of the Members of the Committee have had an opportunity of satisfying themselves, personally[8] with regard to some points of importance, in this portion of the plan. The objections of Mr. Bleychenden have been adverted to in this Report. The excavation of the proposed Canal, through the Salt Water Lake, to join the Eastern Canal, and the continuation of the line of Canals from thence to join the Hooghly at Chitpore, seem to us to be essential to the general success of the scheme, and to promise advantages of the highest importance to the comfort and accommodation [of the inhabitants] of the City.

(8) Sup. page Para, 11.

17. We are satisfied that the Drainage[1] of the city of Calcutta will be materially improved and facilitated by the construction of the Canal, provided due means be taken to prevent the river from flowing into it during the rainy season. The mode, with slight modifications, in which Lieutenant Schalch proposes to effect this object has been generally approved,[2] and as far as we have the means of judging, it will perfectly secure the object in view.

18. Lieutenant Schalch's plan for conveying the filth and ordure of Calcutta through tunnels to the new Canal would not, in our opinion, answer. The objections urged by the Lottery Committee,[3] by Mr. Bleychenden[4]* and other persons, aided by the observations and opinions of individual members, induced the conclusion that the experiment ought not to be tried. The construction, however, at proper intervals, of Tunnels, described[5] by Mr. Bleychenden from the Chitpore road to the new Canal, is considered highly desirable, as they would tend greatly to improve the Drainage of that part of the Town. With this recommendation Government may deem it advisable to authorize the Magistrates to undertake the construction of one Tunnel of that description on the side of the Muchwa Bazar road, or between that, and the Loll Bazar, as an experiment calculated to shew how far the advantages of such a system of drainage would counterbalance its expense.†

19. The insufficiency of the channel of Tolly's Nullah for the Trade in its present state, is accurately described by Lieutenant Schalch, and very generally noticed[6] in the communications received.

20. Mr. Bleychenden remarked on the plan, that the Canal would lessen the supply of water to the Rice fields[7]—this objection is however removed by the site of the proposed Basin and Bund, which leaves a passage to the water from the River Hooghly to flow up the Mahratta[8] Ditch by its present route to the Saum Bazar Bridge. But even were this channel for the River water closed, there are various small creeks and Drains between Chitpore and Dukinsore, through which the River flows, in the Rainy season, into the Rice fields around the Dum-Dum Cantonments, and into the Salt Water Lake.

21. The Committee have examined the levels taken by Lieutenant Schalch, compared them with tables in the Surveyor General's Office, and in possession of the Lottery Committee, and referred to other documents on their proceedings. All these attest the correctness[9] of this portion of Lieutenant Schalch's labours. The slight variations[10] attempted to be established, would, were other proof wanting, serve to corroborate the opinions which we entertain on this point.

22. The purchase of land along the line of the Circular road, forming an important item in Lieutenant Schalch's calculations, much pains have been taken to ascertain its value. The tables furnished by the Lottery Committee, and Collector of the 24 Purgunnahs, as given in the margin,[11] exhibit nearly the same results; and the individual inquiries of the members of the Committee confirm the correctness of the rates assumed.

23. *Thirdly,*[12] on the navigation through the Sunderbuns obstacles, advantages, &c. &c.

The correspondence on this part of the investigation has been extensive, and the communications received, have tended to establish the opinion generally entertained on the difficulties and

(1) Vide paper marked E. 11. & E 13

(2) Vide paper marked E. 6. E. 12 *a*. E. 14 E. 15 *a* E. 38. *a*.

(3) Vide paper marked E. 13.

(4) Vide paper marked E. 14.

(5) *Ibid.*

† Estimated by Mr. Kyd, at 50,000 Rs per mile, Vide paper marked E. 15 *b*

(6) Vide paper marked E. 19. *a*. E 20. *a*. E 21 *a*. E. 40. E. 11. *a*. & E. 41. *a*

(7) Vide paper marked E 11.

(8) Vide paper marked E. 15 *b*. E. 43

(9) Vide paper marked E. 6. E 13 E. 15 *a*

(10) Vide paper marked E 14.

(11) Table 1st. vide Paper marked E. 34 *f*

Statement shewing the estimated value of the grounds per cottah situated in the Panchawungong, extending from Circular road to the north east extremities of the road as follows

| LIMITATIONS. | At. 1000 ft. | At. 2000 ft |
|---|---|---|
| From E. Canal to Bahagat Rd | 100 | 50 |
| To Soorah road, .. .. | 50 | 25 |
| ,, Maniktollah Ditto, . .. | 40 | 20 |
| ,, Hauteebaugan Ditto, . .. | 32 | 16 |
| ,, Saum Bazar Ditto, .. | 32 | 16 |
| ,, Chitpore Ditto, .. .. .. | 100 | 50 |

*Collector's Cutchery 24 Purgunnahs the 13th May, 1822.* E. E. (Sd) C TROWER, *Collector*

Table No. 2. Vide paper marked E. 13

| | | |
|---|---|---|
| From E. Canal to Bahaghat Rd. | 100 | 50 |
| To Soorah road, .. .. .. .. | 50 | 25 |
| ,, Maniktollah Ditto, .. .. | 40 | 20 |
| ,, Hauteebaugan Ditto, .. .. | 32 | 16 |
| ,, Saum Bazar Ditto, .. .. .. .. | 50 | 25 |
| ,, Chitpore Ditto, .. .. .. .. | 100 | 50 |

*Lottery Committee Calcutta 27th May, 1822.* (*Signed*) J. H. BARLOW, *Actg. Sec Loty. Com.*

(12) Vide paper marked E. 1 *f*.

NOTE.—This name is erroneously spelt—for "Bleychenden" read "Blechynden"—J. M

dangers of the present route. The preference given to Lieutenant Schalch's scheme is so decided, that the Committee might confine this part of the report to a general recognition of the statements in the Memoir. The present state of the passage through Tolly's Nullah,[1] is a prominent defect in the existing route, while the danger and delay of the passage across the great rivers in the Sunderbuns, such as the Roymungul[2] &c. are generally admitted. The aversion of Native boatmen to the Sunderbun passage is stated to be strong: the dread of Tigers; the privation experienced in the want of fresh water, and of places on shore for cooking, are the ostensible and natural causes for this aversion.

(1) Vide paper marked E. 19. *a*. E. 20. *a*. E. 21. *a*. E. 40. E. 41. *a*. E. 41. *a* E. 49. *a*.

(2) Vide paper marked E. 19. *a*. E. 21. *a* E. 22 *a*. E. 10 E. 41 *a* E. 11. *a*. E. 19.

24. The connecting Canals, proposed to be excavated between Koolnah and the Salt Water Lake, appear to us easy of execution. The Canal from Deacal to the Juboonah opposite to Hoosinabad, forms a very important and essential part of the plan, the omission of which must be considered greatly to diminish the value of the Scheme.

25. The tract of country through which the new Canals will pass, is so little known to Europeans, that we have failed to obtain any material information on matters of local detail, connected with that part of the country.—We recommend that the jungle which will occasionally be found on the sides of the Canals, as well as on the sides of the natural channels in the route suggested, should be cleared to a considerable distance; that the tracking paths should in no case fall short of 30 feet in width; and that even an increased dimension in this respect should be given when circumstances may admit.

26. With regard to the levels of the country, the course of the rivers, the probable effects of the tides, the facility of excavation, and the efficient duration of the Canals,—no facts[3] have appeared to render questionable the general accuracy of the estimates submitted by Lieutenant Schalch for this portion of the work—except in as much as they may be affected by the Committee's recommendation of an augmented width of tracking ground; this will not add materially to the estimates in the purchase of land, but merely in the cost of labour for grubbing and clearing the additional space from jungle and trees.

(3) Vide paper marked E. 11 E. 15. *a* E. 19 *a*. E. 21. *a*. E 22. *a* E. 38 *a*. E, 40 E. 41. *a*

27. The chief advantages which would result from the execution of this part of Lieutenant Schalch's plans are, First, a shorter passage; on this point, from the statements[4] before the Committee, the passage between Calcutta and Koolnah may be estimated in the two seasons of the year, to average at *seven* in the fair, and *ten* days in the unfavorable season. The passage by the Canals will be nearly equalized at all seasons, and will never be found to exceed *three* days duration, thus creating a saving in time of upwards of *one-half* the passage in the fair, and nearly, *two-thirds* in the unfavorable season of the year; cutting off altogether the contingent delays at the mouths of the large rivers, which are stated to vary in blowing weather from three days to a week. Secondly, the avoiding considerable dangers and difficulties experienced in the present route. On these should naturally follow, diminished freight and insurance on the transport of goods, and proportional encouragement to commercial intercourse and enterprise. A contingent advantage to Government anticipated by us, and generally confirmed by the communications received, is, the increase of cultivation[5] on the line of the new route. From this opinion, however, Mr, Dale,[6] one of the Commissioners in the Sunderbuns has dissented.

(1) Vide paper marked E. 19. *a*. E. 20 *a*. E 21 *a* E 30. *a*. E 31 E. 10.

(5) Vide paper marked E. 19. *a*. E. 21. *a* E. 40. E. 41. *a*.

(6) Vide paper marked E. 44. *a*.

28. That gentleman forwarded a petition[7] from certain landholders Eastward of the Beedadory river, praying that the proposed Canals may not be carried through their Estates, which lay between the rivers Beedadory and Issamutty. Their objection to the proposed Canals, is, that it will subject cultivated tracts to the desolating effects

(7) Vide paper marked E. 44. *b*

of the salt water, which would be admitted by the Canals; Lieutenant Schalch has had Mr. Dale's observations, and the petition before him, and has offered the following remarks on them—viz.

29. "The part[1] of the country alluded to by Mr. Dale, is equally with the other "Sunderbun tracts inundated, during the prevalence of the spring tides, to a depth gene-"rally of a foot. The cause of the inundation is the overflow of the tides in the nume-"rous streams which intersect the country, and which communicate freely with the sea; "consequently no additional body of salt water will be introduced by excavating the Canal "in question, as it connects the above streams laterally, or at right angles to the direction "of their current. As the salt water flowed into the Jubboonah above Morrieson's cut "by the old passage through the Sunderbuns, the opening of that passage could not have "been the cause of injury to the cultivation. I made particular inquiries at the place "itself, and at Baugundie, from which it appears that the cultivation of the land alluded "to had been relinquished in consequence of the exorbitant exactions of the Zeemeen-"dars. As a proof that the proximity of salt water streams does *not* forbid the cul-"tivation of the adjacent land, it may be mentioned that there is a large tract immediately "to the west of Hussienabad which is now in a high state of cultivation, although "streams of the above description flow through it in every direction."

(1) Vide paper marked E 41. *a.*

30. Having weighed the statement in the petition, and the observations of Mr. Dale;[2] with the remarks of Lieutenant Schalch, and compared these with the line proposed for the Canals as traced on the Map of the Sunderbuns, it appears to the Committee, that any new danger from the introduction of salt water by the canals is neither reconcilable with the effects produced on cultivated tracts under similar circumstances; nor with the existing course of the salt water streams, (north and south) in this tract—as Lieutenant Schalch justly observes, the Canal, running east and west, would only have the effect of joining those streams *laterally;* a more circuitous direction being thus given to the waters admitted through the Canals, the country should be less liable to the introduction of Salt Water than it is by the present channels open for its passage; and the Committee therefore have not deemed the objections of sufficient importance to require any change of course in the proposed Canals, or the adoption of any more extended investigation on the subject.

(2) Mr. Philipps [Phillips] Assistant Salt Agent consulted the natives (in his neighbourhood, Koolnah) who were anxious that the Canals should be formed. Vide paper marked E 21

31. In closing this branch of the question, the Committee have only to remark, that, notwithstanding the advantages enumerated, they should be disposed to attach comparatively little importance to the execution of this part of the plan, if it were considered alone, and unconnected with the remaining portion,—viz. the improvement of the Channel through the Salt Water Lake, and the extension of the Canal to join the Hooghly River at Chitpore.

32. *Fourthly,*[3]—On the direct navigation between Calcutta and the Ganges by the Hooghly, Mattabangah, Baugrutty and Jellinghee rivers.

(3) Vide paper marked E 48

Government will have observed that no pains have been spared by us to acquire correct and authentic information, regarding the practicability of opening a more direct and permanent communication with the Ganges, than that proposed by Lieutenant Schalch. The numerous documents before the Committee all lead to the conviction, that the several direct routes to the Ganges have, with occasional exceptions, long been, and are likely to continue, uncertain[1] during the months of February, March, April, and May; nor have any measures been suggested, by those referred to, from which confident hope

(1) Vide paper marked E. 14 E. 42 & E. 45 *a*

could be indulged, of permanently keeping open any of the Rivers which communicate with the Ganges and the Hooghly.

33. Measures for keeping open a direct communication with the Ganges were agitated between the years 1795 and 1802. A Minute of Lord Teignmouth, and an extensive correspondence carried on with Government between January[1] 1795 and August 1802, by the late Surveyor-General, Lieutenant-Colonel Colebrook, have not been overlooked; some of the propositions detailed in these letters were adopted at a subsequent period, but taken collectively, the arguments advanced do not encourage the hope of permanent success in such undertakings.

(1) Vide paper marked E. 55. to E. 62 inclusive.

34. The valuable communications of Mr. J. S. May,[2] the Superintendent of Tolls &c. &c. on the Nuddeah Rivers, throw great light on this subject, and the Committee trust that the exertions of this gentleman, with the means placed at his disposal for keeping open the head of the Mattabangah River during the dry months, will hereafter tend, in a greater degree, to the attainment of this desirable object.

(2) Vide paper marked E. 42. & E 42 *a.* to E. 42 *c.* inclusive.

35. But whether this expectation be realized or not, we are disposed to consider the advantages of Lieutenant Schalch's plan, with reference to the commerce of the Eastern and South-Eastern Provinces of Bengal, rather than to that of the Western and Central Provinces under this Presidency. We are of opinion that, without advertence to the contingent benefits which may probably result to the commerce of the latter Provinces from the execution of Lieutenant Schalch's plan, the undertaking is justly entitled to the support of Government, simply on the ground of its expected results in relation to the Eastern Provinces, and the city of Calcutta.

36. With reference to the opinion of Major Rennel on these subjects generally, and particularly to the strong corroboration afforded by his Memoir to the superiority[3] of the Chundnah and Gurroy rivers, which unite in the neighbourhood of Moosundurpoor in the Jessore district, we have no hesitation in expressing our reliance on the accuracy of Lieutenant Schalch's information, as to the fact that these rivers are navigable at all seasons to boats of large burthen; the former of these rivers has always been so navigable since the memory of man, and there is every probability of the latter continuing so. During seasons when the more direct routes are closed, boats from the upper provinces as well as from Purneah,[4] Dinagepore, Nattore, Rungpore, Mymensing, and districts in that vicinity, can safely and beneficially follow the route of the Chundnah to Koolnah in the Sunderbuns.

(3) Vide paper marked E. 51

(4) Vide paper marked E 26

37. Boats having to proceed to Calcutta from the Eastern districts of Bengal would of course proceed, in preference, through the Sunderbuns. Lieutenant Schalch's plan does not embrace the consideration of any measure for improving the navigation by the Chundnah or Gurroy channels, or by the more Southern channels above adverted to, as far as Koolnah; the navigation by either route to the latter place seems to be sufficiently safe, and not to require any expenditure for its improvement.

38. The attention of the Committee had been drawn to a project for opening a Canal Communication between the Baugrutty river and the Ganges from Rajmahal[5] and its vicinity. On this project we are enabled to decide with confidence, one of our Members, Mr. Gordon, having proceeded, in company with Lieutenant Schalch, to examine that part of the country, and to ascertain the nature of the soil. From the result of this examination, corroborated by opinions recorded on our Proceedings,[6] the Committee are convinced that any attempt to connect the Ganges with the Hooghly by a Navigable Canal in this direction, would altogether fail of success.

(5) Vide paper marked E. 10. E. 30.

(6) Vide paper marked E. 13. E. 25. E. 42. *b.* E. 51.

39. *Fifthly*,[1]—On the nature and extent of the Trade, within the influence of the navigation, to the Eastern and Western Provinces.

On this head it was considered highly important to obtain correct Tables shewing the quantity and value of Imports and Exports of the Inland Trade; and thence to have framed an approximate estimate of that portion which might be expected to pass through the Canals. From such data a calculation of the probable amount of Tolls, derivable from this source, would have been attempted, in order to show how far the receipts would cover the interest on the outlay and expenses incidental to the preservation of the Canal.

The information collected[2] not proving adequate, the Committee are compelled to abandon their intention.

40. The advantages to the city of Calcutta of a free communication with the Sunderbuns must increase in value in proportion to its augmented trade and population; and with regard to that part of the Canal which embraces one half of the town, it must be obvious that great and solid advantages and facilities will be afforded to the inland Exports and Imports; it will enable the Native Traders, in particular, to convey, at all seasons, their goods, to within a short distance of their ultimate destination, through a safe channel, to a commodious and convenient harbour.

41. The more bulky articles of consumption will, by means of the Circular Road Canal, be distributed round the city at a reduced cost; the articles principally alluded to, are grain, salt, coal, charcoal, bricks, chunam, and firewood. The Sunderbuns is the great resource for the supply of firewood to the city of Calcutta, and the proposed communication must favor its importation at a reduced rate.

42. *Sixthly*,[3]—On the mercantile advantages resulting from the adoption of Lieutenant Schalch's proposition.

This is a branch of the investigation on which diversity of opinion has been expressed. The Board of Customs, Salt, and Opium,[4] have, in particular, dissented from the opinion generally expressed of the mercantile and other advantages to be expected from Lieutenant Schalch's plans.

43. (1st)—They consider the advantages doubtful, and much over-rated by Lieutenant Schalch. (2nd)—That a toll might deter the native importers from the Eastern Provinces from availing themselves of the Canals. (3rd)—That the saving in time is not so great as to constitute a decided advantage. (4th)—That any revenue derived from tolls would produce an equal reduction in the amount now collected at Tolly's Nullah[5], and, (5th)—That on the whole the Board are not able to satisfy themselves that the advantage of the proposed Canal, in a mercantile point of view, would justify the outlay. On the proposed formation of a basin, the Board are of opinion that empty boats might resort to it, but not if a heavy toll were exacted; to the trade of the Western Provinces they think the harbours of no advantage.

44. To the force of objections from such authority, the Committee give due weight. It may, however, be remarked, that the 2nd objection is set aside by the 4th, which admits the collection of a toll at present; consequently readiness to pay an equal toll on the new route would exist. Were the channel now open, sufficient for the trade, there can be no doubt, that the collections on the new, would be met by a proportionate falling off in the old route, but this is by no means the case, as goods are frequently landed[6] at a distance from Calcutta, to avoid the dangers and delays now experienced in passing through Tolly's Nullah.

(1) Vide paper marked E 4 *h*.

(2) Vide paper marked E 21 *b*. E. 21. *a* E. 28 E. 29 E. 29 *a*, & E 29. *a* 1. to E 29 *a* 6 E. 42 *c* E 15. *b* E 65 *b*

(3) Vide paper marked E. 4 *i*.

(4) Vide paper marked E 65 *a*

(5) On an average of the last *five years* the Toll collected was Rs. 63,626-12-5 per annum. Vide paper marked E 31 *a* E 31 *c*

(6) Vide paper marked E 11 *a* E 11 *a*

45. On the 3rd objection, - It may be observed, that to the saving in time much importance is attached by the River Insurance Company, and other persons consulted; three days is said to be taken in passing to and from Kidderpore Bridge to Gurriah Haut, so that independent of the advantages of a shorter route, here is a saving of three days in a passage of seven; which is the time usually taken to and from Koolnah. The dangers and difficulties of the present route are known to the Board; yet on the whole their conclusions is [are] unfavorable to the Scheme. Were, however, their supposition adopted, that one-eighth of the Western[1] Trade might be drawn into the new Canals, it would, in addition to the Trade of the Eastern and North-Eastern districts, furnish, in the judgement of the Committee, ample grounds for their recommendation of Lieutenant Schalch's line of Canals.

(1) Vide paper marked E 65 b. Where at a Toll of one per cent it is calculated to yield 50,000 Rupees per annum.

46. To the proposed basin or harbour near Chitpoor the Board of Customs, Salt, and Opium, attach little value; deeming the shelter which boats now obtain at the Ballykhal and other creeks above and below Calcutta, sufficient. In this opinion Messrs. Mercer and Co. also generally concur. But the Board of Trade[2]—Messrs. Stewart and Robertson,[3]—the River Insurance Company,[4]—and almost every other individual consulted, have expressed the most favorable opinion of this part of the scheme. To the European Merchants whose Warehouses are on the banks of the Hooghly, the basin may be less advantageous; but to the Import Trade, carried on by Natives, which is unquestionably the most important to the comfort and interests of the city of Calcutta, the Canal round the Circular Road and the Basin will prove of the greatest benefit.

(2) Vide paper marked E 29.
(3) Vide paper marked E 30. a.
(4) Vide paper marked E. 20 a

47. From various statements before the Committee, it appears that large boats laden with cotton, &c. cannot easily pass through the present Sunderbun passage;[5] the width proposed to be given to the new Canals will admit these boats, and this circumstance, with the other advantages secured, will probably induce some at least of the Western Trade boats to take advantage of the new channels in preference to the hazard, delay, and chance of ultimate detention frequently experienced, in the dry season, by attempting either of the more direct routes from the Ganges into the River Hooghly.

(5) Vide paper marked E 18 a

48. The Committee close this last branch of their inquiry, by observing, that, although the mercantile advantages of the scheme are not unanimously subscribed to in the correspondence recorded on the Proceedings, yet the great mass of opinions is favorable; and the Committee have a confident hope that the sum, proposed to be expended, will, in the earliest stage of opening the Canals, produce a return of six per cent.; while the benefits conferred on the city of Calcutta are so obvious, and important to the Capital of a great Empire, that the Committee feel persuaded the support and protection of Government to the undertaking may be wisely accorded, without scrupulously calculating the direct pecuniary returns which its execution might produce.

49. It now remains to the Committee to notice the Estimates contained in Lieutenant Schalch's Memoir.—They find it here necessary to remark, in regard to the total expense likely to be incurred in the completion of the work, that, they have failed to obtain that complete information, on many points, which alone could enable them to submit their sentiments to Government with confidence in their accuracy.

50. The Estimates for the whole of the proposed operations from Koolnah in the Sunderbuns to the Salt Water Lake, amount to Rupees 2,30,703, including the Canal from Deacol[6] to Hoossnabad, which the Committee have recommended as essential to the full

(6) Estimated at 60,000 Rs. Vide paper marked Part of paper A page XXVI

success of the general plan. The average rate assumed as the cost of excavating the Canals being the same as that allowed for digging tanks in Calcutta, and its vicinity, is probably higher than that which will be incurred in many parts of the route, and is not likely to be exceeded[1] in any.

51. The assumed rate of clearing the jungle and brushwood, viz, two Rupees a beegah, appears also to be sufficient.

52. The rate[2] of 10 Rupees per beegah, as the average cost of land on the line between Koolnah and the Salt Water Lake, will probably cover the actual expense. In those parts of the line where the Canal may approach villages and cultivated ground, the rate will undoubtedly be higher; but in others where it passes through jungles, waste land, or jheels, the ground will be obtainable at little or no expense. If however, the Committee's recommendation should be adopted, a quantity of ground exceeding that estimated will be necessary for the tracking paths of 30 feet breadth. Including therefore every contingency, we are of opinion that this part of the plan may be safely estimated as not likely to exceed Rupees 2,80,000.

(1) Rates of Tank digging are entered on the Proceedings—Vide paper marked E. 14. E. 15. b. E. 19. a. E. 22. a. E. 41. a. E. 43. E. 44. a. an average from these is less than the Estimate of Lt. Schalch.

(2) Vide paper marked E. 41. a. E. 41 a.

53. The expense of bunding in and deepening the channel through the Salt Water Lake, and of deepening the Eastern Canal, is calculated by Lieutenant Schalch at 17,387[3] Rupees; but the Committee consider it necessary that the banks of the Eastern Canal be sloped, the road on the north side of the Canal widened, and its present height reduced; and with these improvements, the work may be calculated at 40,000 instead of 17,387 Rupees.

(3) This Total is formed of three items, viz.

| | |
|---|---|
| Part of paper A. page xxvi. | 2,000 |
| Ditto ditto | 5,411 |
| Ditto ditto | 9,976 |
| Total, | 17,387 |

54. The assumed cost of land along the Circular road—viz. 60 Rupees per cottah*—appears sufficiently large, provided the Canal be carried at an average distance of from 2000 to 1500 feet from the road, which is the site the Committee recommend. If, however, as would seem expedient in this part of the Canal, the road on the Calcutta side be taken at 60 instead of 30 feet breadth, the estimate for the ground for the road will be raised from 48,000 to 96,000 Rupees.

* See Tables in para. 22 of this Report.

55. The making of roads, and the construction of the bund for excluding the River, during the rains, are not provided for in Lieutenant Schalch's estimates. If the road be for the present made cutcha only, the cost of these works may be roughly assumed at 60,000 Rupees.

56. The estimates in the Memoir provide for the construction of five large bridges[4] over this part of the Canal, at an expense of 20,000 Rupees each; supposing that the experiment now in progress of throwing a suspension bridge over Tolley's Nullah, should succeed, the bridges over the Canal should be constructed on the same principle, by which they may be made sufficiently commodious, without exceeding the Total estimate of 1,00,000 of Rupees.

(4) Vide Part of paper A. page, xxvi.

57. The formation of the basin near the head of the Canal, where it unites with the Hooghly River, has been included in the general calculation for the Canal from the Durrumtollah to the river at Chitpoor by estimating the average cost of excavation of this part of the line at 30,000 instead of 10,000 Rupees per mile—the rate assumed in other portions of the work, where a less breadth and depth are given to the Canals.

58. On the foregoing principles the expense of completing the projected works would stand as follows:—

## ABSTRACT.

| | |
|---|---|
| Expense of works between Koolna and the Salt Water Lake, .. .. | 2,80,000 |
| Do. of bunding and excavating the Channels through the Salt Water Lake, and deepening and improving the Eastern Canal, .. .. .. | 40,000 |
| Do. of excavating the Canal from the head of the Durrumtollah to the River at Chitpoor, .. ... .. .. .. ... .. | 1,23,350 |
| Do. of 270 Beegahs of grounds for the Canal and Road at 60 Rupees per cottah, .. .. .. .. ... .. ... .. | 3,24,000 |
| Do. of five Bridges over the Canal, .. .. .. .. .. .. | 1,00,000 |
| Do. of making the Road, Bund and Drains, .. .. .. .. | 60,000 |
| Total Rupees, | 9,27,350 |

59. To this sum may be added 1,00,000 Rupees as the expense of superintendence, establishments, and other contingencies, the total outlay, on the part of Government, would be about ten lacs[1] or ten and a half lacs of Rupees, without including any charge for interest on the outlay.

60. It forms a material part of Lieutenant Schalch's plan, that, in addition to the ground required for the Canal and Road (being in width near 200 feet) a considerable portion of ground lying along the inner or Western side of the road be at the same time purchased.[2] That Officer infers, that, the surplus ground, so purchased, might be resold, after the Canal and road shall have been opened, at a profit of 220 Rupees[3] per cottah. The Committee are not, however, of opinion, that the result would warrant so sanguine a calculation; but they would recommend, that, a quantity of ground, averaging about 100 feet in breadth, be purchased along the whole extent of the inner line of the Canal bordering the Circular Road; which would amount to 132 beegahs. This surplus ground might be eventually resold at a profit of 80 Rupees, per cottah or 1600 Rupees per beegah The profit thus realized would be about 2,11,200 Rupees, to be deducted from the amount of the estimate given above, so that the net expense of the undertaking would be reduced to about eight lacs of Rupees.

(1) Lieut. Schalch's original Estimate was Rupees 9,45,309, but this included no charge for Superintendence. Vide paper marked Part of paper A. page xxvi.

(2) *Ibid.*

(3) *Ibid.*

61. The Committee feel assured that a considerable amount of toll might be levied on Boats passing through the proposed Canals—which would undoubtedly be generally preferred to Tolly's Nullah; some reduction would, necessarily, take place in the tolls now levied in that channel; but a considerable increase in the amount of commercial transport must be anticipated, beyond that which now enters the Salt Water Lake or Tolly's Nullah, although there are no accurate grounds on which to estimate the expense of tolls beyond the present collections on the Eastern Canal and Tolly's Nullah; yet, from the general information before the Committee, it might be safely stated in the course of two or three years, to afford a net increase of 50,000[4] Rupees per annum.

62. An equal sum,[5] it is expected, would be realized from a toll on boats resorting to the harbour, near the Hooghly, either for shelter from the weather, or the discharge of their cargoes.—Deducting from the assumed proceeds of one lac, 40,000[6] Rupees for charges of superintendence and repairs, there would remain an annual income of 60,000 Rupees, or $7\frac{1}{2}$[7] (seven and an half) per cent on the capital laid out in the undertaking.

63. In these calculations the Committee have cautiously assumed a higher outlay, and smaller return, than evidence and circumstances may seem to require. They are however

(4) Lieut. Schalch's Estimate was Rupees 80,000, *Suprà* page xxvi.

(5) Lieut. Schalch's Estimate was Rupees 75,281 *Suprà* page xxiv.

(6) Lieut. Schalch estimated this charge at Rupees 35,000 Vide part of paper A. page xxvii.

(7) Lieut. Schalch estimated this at $14\frac{1}{4}$ per cent. *Suprà* page xxvii

solicitous to avoid the hazard of future disappointment ; while they think the plan holds out so fine a prospect of great and general advantage to the public interests, that the Government will be disposed to encourage its adoption, if they should be satisfied that the scheme will realize a return of 6 or 7 per cent on the expenditure.

64. By the instructions of Government of the 28th July 1821, the Committee are required to submit their sentiments with regard to the measures to be pursued for the due superintendence[1] and execution of Lieutenant Schalch's plan, if its adoption should appear to them desirable.

(1) Vide paper B. page xv.

They accordingly beg to offer the following suggestions, 1st as to the execution of the work itself; and, 2ndly, as to the authority to which the executive officer should be subject, and through which all communication with Government, during the progress of the work, should be conducted.

65. The Committee conceive that the Governor General in Council will naturally be desirous of availing himself of Lieutenant Schalch's services, if the adoption of the plan should be ultimately determined upon. They have reason to know that in the preliminary inquiries conducted by Lieutenant Schalch, and which were necessary for the due preparation of his plans and calculations, as well as in local investigations since prosecuted by him, that officer has been subjected to much personal labour and expense, and they are bound, in justice to Lieutenant Schalch, to observe, that his talents, local knowledge, and other qualifications eminently fit him for the successful execution of the work. Independently of which it is obvious, that he is likely to feel more peculiarly interested than others in the full realization of the advantage which he has anticipated, and will thence be led to use every exertion in his power for the economical and complete accomplishment of the scheme. The Committee trust that under all the circumstances of the case, they shall be pardoned for having expressed so freely their sentiments in regard to this point.

66. The officer who may be entrusted with the general superintendence of the work, should have the assistance of a well educated Assistant, acquainted with surveying and levelling ; and of a liberal establishment of Overseers, Sircars, and Boats.—With such aid, and with the cordial co-operation of the proper Civil Authorities, no difficulty is to be apprehended in the due superintendence, at the same time, of the operations along the whole line of the Canal ; and the Committee are satisfied, that an establishment, such as that proposed, will be conducive to real economy, and to the public interests in other respects, by facilitating the early completion of the work.

67. The portion of the work to be more immediately placed under the direction of the Assistant (if Government should think it proper to authorize one) should be that lying between Koolna and the Salt Water Lake, which includes the Canals of Nuzzerpore, and Narde, with those of Deacol and Husseinabad. His head quarters during the working season, might be placed at Baugundie.

68. The Superintendent's head quarters should be at Calcutta, where his presence would be necessary for the excavation of the Canal from the Salt Water Lake to the River at Chitpoor; and in the construction of the different works of the Canal. The improvement of the existing passages from Behmee to the Salt Water Lake, including the small Canal at Narainpoor, should also be superintended by him ; but would not require a large share of his attention.

69. Previous to commencing the excavation of the Canals, it will be necessary that the Superintendent, and his Assistant, should minutely survey the whole line of the

proposed navigation, with a view to discover any local advantages that may influence its final direction, such as partial Jheels, hollows or Nullahs which may have been overlooked in the original Survey. The line of the Canal being then determined, and the ground marked out, the Collector of the district, or other Revenue Officer specially nominated to the duty, should be furnished with Maps on a large scale. He would then proceed in person, or depute proper officers from his establishment to settle with the Zemindars for that quantity of land required.

70. Under the Superintendent and his Assistant, men taken from the Town Major's List or from some of the European Regiments near the Presidency might be advantageously employed as Overseers; a sufficient number might be obtained of good character and well qualified for the duty, from having been engaged as labourers in similar works in Europe.—Each Overseer should have under him a Sircar, and a paunsway, with a Mangee and four Dandies.

71. The employment of Overseers of this description, in preference to natives, will greatly promote the success of the scheme.—The indolence, and dishonesty of natives, when engaged in public works, is too well known to need any remark The services of the above class of Europeans may not only be obtained at the same price, but their honesty and activity may be generally relied on, or the want of these important qualifications be easily detected and remedied.

72. A staff salary of 25 or 30 Rupees a month in addition to Regimental pay and allowance, would command the services of the class of Europeans required; and the Committee are satisfied that the men thus employed, will, by their services, more than repay the additional expense incurred

73. The number and stations of the Overseers may be taken as follows, one at Nuzzerpoor to overlook the works as far as Ramnathpoor on the Cobbaduk River;—one at Narolee for the Canal at that place, and the improvements of the natural passages as far as Deacol;—one at Dahatta for the Deacol Canal;—two for the Husseinabad Canal; the residence of one to be at Husseinabad, and the other at Bussera;—one for that part of the line between Bussera and the Salt Water Lake, which includes the Narainpoor Canal;—one for the Eastern Canal;—four for the Circular Canal from Entalee to the river Hooghly at Chitpore; and two for the Bridges. The abstract will stand as follows.—

| | |
|---|---|
| Nuzzerpore, | |
| Narolee, | |
| Dahatta, | |
| Husseinabad, | |
| Bussera, | |
| Narainpore, | |
| Eastern Canal, | |
| Circular Road, | 4 |
| For the Bridges, | 2 |
| Total, | 13 |

With 13 Sircars and 13 Paunsways

74. In this Estimate the subordinate detail of Clashies &c. is not included, as it is provided for in the estimated cost for cubic measurement.

75. It is difficult, at present, to say what personal establishment the Superintendent may require.—It will of course depend greatly on the activity with which the work is conducted, and the quantity undertaken at the same time. It may, perhaps, be thought

most proper to refer the consideration of this subject to the authority under whose immediate control the Superintendent may be placed.

76. The Committee now proceed to advert to the second point, viz. ' the authority to " which the superintending officer should be subordinate, and through which all corres- " pondence with Government, during the progress of the work, should be conducted."

For this purpose a Committee, consisting of three or four Public Officers of Government, stationed at the Presidency, might be constituted.

77. The junior Member might officiate as Secretary, and should be conversant with accounts, and qualified to conduct the detail of the Committee's correspondence. The duties to be performed by him, in this capacity, would be of a responsible nature, and would render it necessary that the whole, or the greater portion of his time, should be given to this object.

78. The Committee should exercise a general, and careful control over the whole of the operations.

79. They should furnish to the Superintendent, and through him to the Assistant and European Serjeants, such forms of account as might be deemed proper.

80. The accounts of the actual expenditure should be monthly submitted to, and checked by them, and a half-yearly account and report should be furnished by the Committee to Government.

81. The Committee should be vested with a discretionary power to authorize, or direct any immaterial alterations in the original plan, which circumstances might from time to time suggest, either in regard to the line of the Canal, its dimensions in different places, the distribution of the establishment, or to other points.—On all questions involving any essential modification of the original Scheme, or any considerable addition of expense, or otherwise of sufficient importance, the Committee would of course apply to Government for instructions

82. No advances should be made from the Public Treasuries on account of this work, without the previous consideration and sanction of the Committee; and the signature of the Members of the Committee, or of their Secretary, should be in every instance necessary to warrant the payment of such advances

83. The Magistrates and Collectors of the districts through which the line of Canals will pass, should be instructed to facilitate the execution of this important public work, by giving their countenance and aid to the Committee, and to the executive Officers as far as may be consistent with the regulations, and with the rights and interests of individuals; the Committee should also be authorized to correspond with the Board of Revenue, and other functionaries, on matters connected with the duty entrusted to their controul and superintendence.

84. Before concluding their observations on this branch of the subject, the Committee beg to suggest to Government the necessity of providing some legal means for obtaining possession of ground, or premises required for public works of this nature, when the owners, or proprietors may, from whatever motive, decline to enter into fair and reasonable terms for its surrender.

85. It is obvious that very material inconvenience and injury might be experienced in an undertaking of this description, unless their existed some known, and legal means of compelling the surrender (on a just and fair valuation) of private property, situated on the line of the proposed Canals and Roads

86. The Committee trust that few instances of wilful and malicious opposition

will be experienced, and that the Collectors, or Revenue Officers will, generally, be able to secure the requisite ground without difficulty.

87. Some opposition, however, in individual instances, may be anticipated in obtaining possession of the ground required at the back of the Circular Road, and especially in the vicinity of the Hooghly river, and it seems desirable to guard against such obstructions by the previous enactment of suitable provisions.

88. The Committee have nothing further to suggest on this head, and they will conclude their Report by briefly adverting to the services of their Secretary, Captain Faithfull.

(1) Vide paper marked E. 2.

89. From the date of that officer's appointment,[1] on the 21st August, 1821, up to the period of his departure from the Presidency, viz. 18th February last, he was diligently and laboriously employed in collecting from the different Offices at the Presidency, all the information that was procurable connected with the internal commerce and navigation of the lower parts of Bengal, in arranging the numerous questions, whether of a local, or scientific nature, which it was deemed necessary to circulate very widely, and in conducting the general correspondence of the Committee. On the occasion of Captain Faithfull's departure to Berhampore, the Committee took occasion to bring under the notice of Government[2] their sense of his valuable services, and requested that they might be allowed the benefit of his assistance until their Report should be forwarded to Government.

(2) Vide paper marked E. 8

90. With this request His Lordship in Council was pleased to comply, and the Committee trust that the present Report, and the voluminous papers with which it is accompanied, will afford sufficient proof, not merely of the laborious nature of the duties which have devolved on their Secretary, but of the zeal and ability with which Captain Faithfull has executed those duties.

91. The Committee would hesitate to suggest any specific sum, as the amount of the remuneration to be paid to Captain Faithfull, did they not conceive that Government would wish to be informed of their sentiments on the subject. Under this impression they venture to submit that Captain Faithfull be presented by Government with the sum of 5,000 Rupees, being at the rate of 400 Rupees per mensem for the period during which he has been employed as Secretary to the Committee.

92. They farther take the liberty of stating their impression, that if Captain Faithfull's services can be temporarily spared from the office to which he is at present attached, and the arrangement itself should be consistent with Captain Faithfull's personal interest, and convenience, he would be found peculiarly well qualified to fill the situation of Junior Member, and Secretary of any Committee, which may be appointed by Government to superintend and controul the execution of the important works which have been recommended for adoption in this Report.

93. Accompanying this Report are the following documents, viz.:

1, Book of Proceeding.

Case with the original Maps* Nos. 1, 2, and 3, which were received from Government with a copy of Lieutenant Schalch's Memoir.

We have the honor to be, Sir,

Your most obedient servants,

H. SHAKESPEAR,
HUGH MORRIESON, *Capt.*
G. J. GORDON,
G. BANNED.

CALCUTTA,
*28th October*, 1822.

* Lodged in the Office of the Military Board.—J. M.

# E 1.

To H. MACKENZIE, ESQ.

*Secretary to Government in the Territorial Department.*

SIR,

We have the honour to acknowledge the receipt of your letter of the 28th ultimo, (together with its enclosures) informing us, that His Excellency the Most Noble the Governor General in Council, has been pleased to appoint us to be a Committee, to consider and report upon a plan proposed by Lieutenant J. A. Schalch, for opening a permanent communication with the great River, and for other purposes connected with that object.

We have this day met together at the house of our President, and we beg to state, that we shall lose no time in prosecuting those measures which will be necessary to enable us to submit to Government the information required from us.

The various subjects of inquiry, however, to which our attention must be directed, appear likely to involve a very detailed correspondence, which could not be efficiently conducted by any of the Members of the Committee, consistently with their respective duties and avocations, and we accordingly beg to submit our opinion, that the early nomination of some capable and intelligent individual to officiate as Secretary to the Committee appears to us to be essentially necessary.

We have, &c.

*(Signed)* W. B. BAYLEY,

*The 7th August*, 1821. and MEMBERS.

# E 2

To CAPTAIN R. C. FAITHFULL,

*Officiating Assistant Adjutant General*

Territorial Department, Revenue

SIR,

(1) I am directed to inform you, that His Excellency the Most Noble the Governor General in Council has this day been pleased, with concurrence of His Excellency the Commander-in-Chief, to appoint you Secretary to a Committee recently constituted to report on a plan proposed by Lieutenant J. A. Schalchs for opening a permanent communication with the great River, and for other purpose, connected with that object.

(1) Paper E para. 89

2. The Committee in question is composed of the several gentlemen named in the margin, with whom you will of course immediately place yourself in communication on the receipt of this letter.

W. B. Bayley, H. Shakespear, J. Young, Esqs. Captain M'Leod, ,, H. Morrieson, and G. J. Gordon, Esq.

3. It is understood that the arrangement in question, will not hinder the due performance by you of the other duties which at present attach to you, and it is with this understanding that the concurrence of his Excellency the Commander-in-Chief has been solicited, and obtained.

4. His Lordship in Council will take into consideration the question of the remuneration to be assigned to you for the duty which has now been imposed on you, when the Committee shall have completed their labours.

I am,

Sir, &c.,

COUNCIL CHAMBER, *The* 21*st August*, 1821.

(*Signed*) HOLT MACKENZIE,

*Secretary to the Government.*

# E 3.

## *On the Preliminary Proceedings of the Committee.*

The President having proposed—

(1) Paper E para. 1st

*First*, That the Memoir of Lieutenant Schalch be printed,[1] with such exceptions and additions as are marked for the purpose; and one hundred copies be the number furnished under this Resolution.

*Secondly*, That Lieutenant Schalch be requested to undertake the superintendence of an Engraving of the reduced Sketch of his proposed line of Canal, and that he cause fifty (50) copies of such Engraving to be struck off in the first instance.

*Thirdly*, That, as soon as the printing of the Memoir and Engraving of the Sketch shall be completed, the various important questions proposed in the President's Minutes be submitted to the several Authorities and Individuals, whose official station, experience, and opinions shall seem calculated to aid the Committee in framing its Report to Government on the merits and practicability of Lieutenant Schalch's proposition.—

Resolution ordered accordingly.

Resolved, at the instance of Captain Morrieson, that the Secretary be directed to institute the necessary inquiries to ascertain what information the Records of the Public Offices will afford, relative to the opening, in the year 1795-6, of the passage in the Soondurbunds, called Goodlad's Creek, also that similar inquiries be instituted on the Cut opened by the late Lieutenant Morrieson, of Engineers, while that officer was engaged in conducting the Survey of the Soondurbunds.

Resolved, at the instance of the Secretary, that the undermentioned Memoirs and Records be requested—if in existence in the Public Offices of Government:—the Committee considering such documents likely to throw light on the subject before them, viz.

1. Colonel Colebrooke's (late Surveyor General) Reports or Notices on the Navigation of the Baugruttey.

2. Major Rennell's soundings of the Issumutty and Cobbaduck Rivers, and this Officer's Memoirs, Notices, or Official Reports on Inland Navigation between the Ganges and the Delta.

3. Captain R. Blane's (Engineer) Memoir and Reports on the re-opening of Firoze Shah's and other Canals to the North and West of Delhy.

4. Lieutenant Forbes's (Engineer) Memoirs, &c.

5. Captain Everest's (Artillery) Report in the year 1817-18 on the removal of obstructions in the Channels of the Baugrutty, and Muttabangah.

The obvious importance and advantage, that must arise from classing[1] the labours of the several Members of the Committee, by which the various and particular talents of each will be brought to bear on the questions at issue, having come under consideration:—

(1) Paper E. para. 3d.

Resolved,—That H. Shakespear and G. J. Gordon, Esquires, be requested to propose queries connected with the advantages or disadvantages likely to result to the Metropolis; also on points connected with the system of Drainage now in use, and on the effects to be produced thereon by the vicinity of the proposed Canal between the Eastern Canal and the Hoogly River at Chitpore bridge.

Resolved,—That James Young, Esq. and Captains McLeod and Morrieson, be requested to propose Queries connected with the Engineering and Scientific points involved in Lieutenant Schalch's plans.

Resolved,—That James Young and G. J. Gordon Esquires be requested to propose Queries on the Commercial advantages or disadvantages likely to spring from a prosecution of Lieutenant Schalch's plans.

The Committee having in advertence to the appointment of a Secretary, considered that an Office Establishment will be required for carrying on the duties of this Office,—

Resolved,—That the Secretary be required to submit at the next meeting a scale of Office Establishment, and that in the mean time, he be authorized to enter on such arrangements as may be calculated to facilitate the immediate performance of the duties which have devolved on him.

The Committee adjourned.

*(Signed)* W. B. BAYLEY,
,, H. SHAKESPEAR,
,, J. YOUNG,
,, D. M'LEOD,
,, H. MORRIESON, *Captain,*
,, G. J. GORDON,

CALCUTTA,
*30th August,* 1821

*(Signed)* R. C. FAITHFULL, *Captain,*
*Secretary Special Committee Schalch's Plan.*

# E 4.

## In Circulation.

*Secretary's Office, Chowringhee, No. 30.—10th November, 1821.*

(1) Three Draught letters marked A. B and C.
Six Draught of Queries marked **Nos. 1** to **6.**
——ooo——
Two Lists of Queries received from the Members.
(2) Paper E para. 3d.

In sending the papers noted in the margin(1) into Circulation, I may observe, that the classification of subjects, is the one proposed to be followed in the ultimate report to Government.

The six Divisions, 1, 2, 3, 4, 5, 6.(2) naturally presented themselves as calculated to simplify the details of a Report, involving such various and opposite subjects as those which are connected with the propositions of Lieutenant Schalch.

The first and second divisions of the inquiry alone may be considered as affecting the credit and ability of Lieutenant Schalch, and on their receiving a favourable solution from the persons to whom they are referred, the Committee may at once come to a decision—and, if deemed important to divide the Report to Government, this might form our first part. I am not aware of any particular advantage attending this course, beyond the satisfaction it would afford the projector to have his mind set at rest, on the general merits of his propositions.

In case this course should be adopted, it appears to me deserving the attention of the Committee, to take into consideration how far it might be practicable to employ Lieutenant Schalch, during the time that must elapse while prosecuting the other branches of the Enquiry, in a way which should be calculated to add to his experience in the formation of Canals.

This object might be advantageously obtained by recommending to Government the removal of obstructions and deepening the channel of Tolly's Nullah, which is now, I believe, navigated with difficulty. This will, in all probability, be found indispensably necessary to keep open the communication with the Sunderbuns, while the formation of the projected Canals are in course of execution.

It would seem the more essential to attend to Tolly's Nullah, since Calcutta must in a great measure be deprived of the use of the Ballighat Khal, from the time the excavation is begun, for crossing the Lake and opening the communication with the River at Chitpore.

In the List of Queries it will be observed that the whole number on one subject are not in every instance calculated to be referred to each individual in the marginal List of Names. The Queries embrace all that has been suggested by the Members, together with such additions as appeared to me calculated to aid the inquiry. Any further addition that may occur in the course of circulation, can be entered in succession to those already inserted, and the lists of names may be rendered more complete than they now are.

In the List containing the Mercantile Queries, few subjects are noted ; this seems open to much contribution.*

In the Lists of Names, I have felt inadequate to give those of any respectable or intelligent Natives, but it would be very desirable that this should be supplied in most branches of the subject.

Two Draft Letters and List of Queries are circulated, to shew how the arrangement is intended to be applied. It would be impossible to form one Draft Letter that should apply to each person to whom reference is proposed to be made; and, moreover, in many instances one individual will be referred to on more than one branch of the subject.

*(Signed)* R. C. FAITHFULL,
*Secretary Special Committee*

* Some contributions are given in the Draft **No. 6.** accordingly.
*(Signed)* J. Y

## E 4. *a.*

To THE MAGISTRATE OF JESSORE.

SIR,

Under instructions from the Special Committee appointed by Government to report on Lieutenant Schalch's Plans, for opening a new and permanent communication with the Eastern and Western Provinces through the Sunderbuns, I have the honor to enclose a copy of that Officer's Memoir, with a Map of the proposed line of Canals, and to annex a List of Queries to which your reply is solicited.

2. In submitting the subject for your consideration, such Queries only have been proposed as your official and local station suggested; but the general outline of the Scheme being placed before you, will admit of observations or information on points which are not specifically adverted to in the List.

3. The names of any intelligent European Traders or Planters residing near the old or the new line of navigation through the Sunderbuns, would be a very acceptable piece of information, and enable the Committee to obtain intelligence on many points connected with the projected undertaking.

*(Signed)* R. C. F.,
*Secretary.*

## E 4. *a'*

*Queries 1 to 17 inclusive of List* **No. 3** *referred to the Magistrate of Jessore, relative to the Navigation of the Sunderbuns.*

## E 4. *b.*

To HENRY MATHEW, ESQ.,
*Secretary to the River Insurance Company.*

SIR,

In transmitting for your information the enclosed copy of a Memoir by Lieutenant Schalch, and a Map of the country between Calcutta and Koolna, I am instructed by the Special Committee appointed by Government to report on Lieutenant Schalch's Plans, to request the favor of your attention and reply to the annexed List of Queries at your earliest convenience. These have been detailed as specifically applicable to the Office under your charge: I am however instructed to add, that any information or suggestions from the members of the Insurance Company or yourself, on the general bearings of the Scheme under consideration, will be very acceptable.

*(Signed)* R. C. F.,
*Secretary.*

NOTE.—Besides the List of Queries extracted from **No. 3 & 4** the whole of **No. 6** will be sent to Mr. Mathew, but as that List goes in its complete state, a Draft appeared unnecessary.
*(Signed)* R. C. F.
*Secretary.*

# E 4. *b.* (1)

(1) NOTE.—The numbers of the Paragraphs refer to their standing in the general List **No. 3**, the same remark applies to those attached from **No. 4.**
*(Signed)* R. C. F.
*Secretary.*

*Queries* 18(1) *to* 26 *inclusive, also* 13 *and* 14—27 *and* 28, *of List* **No. 3**, *referred to the Secretary of the river Insurance Company, relative to the Navigation through the Sunderbuns.*

# E 4. *b.* (2)

*Queries* 18 *to* 24 *inclusive, also* 17 *and* 25, *of List* **No. 4**, *referred to the Secretary of the River Insurance Company, relative to the direct Navigation between Calcutta and the River Ganges.*

# E 4. *c.*

TO MAJOR GENERAL HARDWICK,
*Commandant of Artillery.*

SIR,

Under Instructions from the Special Committee appointed by Government to Examine and Report upon propositions for improving the Inland navigation of Bengal, and opening a permanent communication with the Eastern and Western Provinces, by a series of Canals between Calcutta and Koolnah on the Boirub River; I have the honor to transmit a copy of Lieutenant Schalch's Memoir on the subject, together with a Sketch of the tract of country through which the line of Canals is to run.

(2) NOTE.—This will be accompanied by List **No. 1.** complete.
*(Signed)* R. C. F.
*Secretary.*

2. In forwarding these documents I have enclosed a List of Queries,(2) having reference to the practicability of Lieutenant Schalch's Scheme, to which your attention is solicited, and your reply to the points therein detailed is requested by the Special Committee at your earliest convenience.

*(Signed)* R. C. F.
*Secretary.*

(3) Paper E para 4. and 9

# (3) E 4. *d.*

List **No. 1.**

Major Gen. Hardwick *Comdt. Arty*
Lieut. Colonel Mouat, *Chief Engr*
Capt. Hudson, *Surv. Gen. of India.*
Lieut. Col. T. Wood, *Engineers*
Mr. James Kyd.
Mr. Bleychenden.
Lieut Colonel Parlby, *Engineers.*
Major J. L. Stuart, *Supdt. Telegraphs.*
Lieut. C. Paton, *Asst. Supdt. of Buildings.*
Major P. Phipps, *Supdt. of Buildings.*

## *References on General Principles, Practicability, &c. of Lieutenant Schalch's Proposition.*

1. Sentiments generally on the practicability of the proposed line of Canals, with reference to the tract of country through which it is to run, and its intersection by the numerous streams which cross its course.

2. On the influence of the tides on undertakings of this nature.—Whether a Canal within tide waters may be considered less liable to injury in its banks by the action and reaction at ebb and flood? Whether depositions of sand and mud are to be expected in a greater or less degree than in the higher parts of the Delta, beyond the reach of tides?

3. Dimensions to be given to the Canal, slope of its banks, and width of track-ways.

4. Supposing the several *strata* of earth, as described in page 17 of the Memoir, to be such as will be found on cutting the Canal; do they appear of a nature to affect the success of the scheme? And with reference to this part of the subject, how far does the remedy proposed in Plate 2, Fig. 1. appear practicable, or likely to be attended with the success desired? Would the *stratum* here above the sand, which is stated to lie between 13 and 17 feet from the surface, be likely, after an excavation has been carried to 20 or 24 feet, to subside on that below the sand, in the manner adverted to by Lieutenant Schalch, and thus form a new slope to the banks of the Canal, which should have no injurious effects on their permanency?

5. On that part of the Memoir, which treats on the line of Canal across the Salt Lake, particular attention is requested, with reference to the production of the results predicted by Lieutenant Schalch, the consequence of the undertaking to the future existence of the Lake, the method of, and spot assigned, for the opening from the Canal to the Lake.

6. On the expediency and safety of carrying the Canal as proposed from the Eastern Canal near the Durrumtulloh to the River Hooghly at Chitpoor. Are any injurious or dangerous effects to the City of Calcutta likely to attend this part of the Scheme? and is it practicable to keep open a communication with the River throughout the year? or would the measure of bunding out the river during the rainy season be indispensably necessary to prevent the City being flooded, and the draining of it injured?

7. Admitting the bunding out the river to be indispensable, does the plan proposed by Lieutenant Schalch in page 18 and Plate 2, Fig. 2. of the Memoir appear well suited to the purpose; or if objectionable, what other might be substituted in its stead?

8. Much of what has been advanced by Lieutenant Schalch in this part of his undertaking depending on the correctness of the levels taken, an opinion on them becomes an important consideration.

9. Does the site of the proposed harbour or basin appear well selected, or could any other be fixed on with greater apparent advantages to the Trade of the City?

(*Signed*) R. C. F.
*Secretary.*

## "E 4. *e.*

### List No. 2.

## *On the influence of the proposed Canal on the Accommodation and Draining of the City of Calcutta and on probable cost of Land per cottah from the Eastern Canal to the Hooghly near Chitpoor, &c.*

1. Assuming that the most effectual way of Draining the Town is by tunnels or large covered drains into which the smaller drains may empty themselves,—what are the advantages respectively of draining into the River, or draining into the Canal, as proposed by Lieut. Schalch?

2. Does any damage arise from letting the river-water through the tunnel, on the south of the great tank, into the covered drain running on the south side of the Bow Bazar Street? What is the rate at which water runs through it?

3. By washing the tunnels and carrying the filth from the Privies into the Canal, would there be any danger of choking up the Canal? or would it make the Canal so offensive as to affect the navigation of it, and to render a residence on the banks of it unwholesome?

4. Would the force of the water through the tunnel be sufficient to carry away the soil and dirt collected in it? or would it still be necessary to have the tunnel cleaned out and the soil removed into the River, as at present.

5. What would be the probable cost of a series of tunnels adapted to a new system of draining on Lieutenant Schalch's proposition? and would the apparent or expected advantages seem to warrant such a charge?

6. In the height of the rains it is proposed to dam up the Canal at the River mouth, consequently at that time there would be little or no current in it; in this comparatively stagnant state would the filth from the drains be carried off with sufficient rapidity to prevent its deposition in the Canal.

7. Supposing the River so high at particular seasons, that it would be objectionable to let the water from it into the tunnels,—what would then be the effect of the tide setting up the Canal from the Lake? Would it run sufficiently high to enter the tunnels? or if prevented doing so by sluice-gates being shut, would there be any danger of the Town being overflowed, supposing very heavy rain to fall just at that time?

8. Are there any serious or insuperable obstacles to the Canal being cut from the River to the existing Eastern Canal, at a distance of between one and two thousand feet East of the Circular road?

9. The lands lying between Dum-Dum and the Salt Lake are now principally inundated by a spring tide passing under the Chitpoor bridge and along the ditch on the Dum-Dum road,—will the stopping up of this channel in the height of the rains cause any important injury to the productiveness of those lands?

There is also an in- nt from the River at ossipoor filled every igh tide.
*(Signed)* J. F.

Yes; and several be- ween Cossipoor and Duckinshore.
*(Signed)* R. C. F.

10. What is the average value of land between one and two thousand feet from the Circular road, and how far is the price of the adjacent land likely to be enhanced by the proposed Canal?

11. What is the rate of tank-digging* at or near Calcutta?

* This information ay be obtained from ersons who have been ecently engaged in igging tanks.
*(Signed)* R. C. F.

Articles 10, and 14. xclusively to the Lot- ery Committee.
*(Signed)* R. C. F.

12. What value should be attached to the formation of a basin or harbour for boats near Chitpoor, or what class and number of boats would have recourse to it for protection from the Bore, &c. &c. and at what seasons?

13. Of what are the *strata* of earths composed at the following depths below the surface on or near the line of Canal from the Eastern Canal to Chitpoor?

From the surface to 13 feet
From 13 to ...... 18 ditto.
From 18 to ..... 21 ditto.
From 24 to ....... 36 ditto.
From 31 to ...... 40 ditto.

14. How nearly do the Levels of Calcutta and its vicinity taken by Lieutenant Schalch correspond with those taken in former years? On this point an abstract table of former levels, noting the period when, and persons by whom taken, is requested from the Lottery Committee.

*(Signed)* R. C. F.
*Secretary.*

# [1] E 4. *f.*

(1) Paper E. para. 4. and 23.

## List No. 3.

## *On the Navigation through the Sunderbuns, Obstacles, Advantages, &c. &c.*

1. How far, from your knowledge of the part of the country through which the proposed Canals are to run, do you conceive the scheme practicable? or what objections occur to you as likely to oppose its accomplishment?

2. How far do depositions of mud and sand tend to fill up those navigable channels which have come under your observation? and what effects have these causes had within your knowledge on Goodlad's Creek and Morrieson's Cut?

3. What influence does the ebb and flood of the tides appear to have on the permanency of the banks of the streams or Canals—do they appear more favourable to their duration than the regular flow of water in one direction, which takes place in rivers without the influence of tides?

4. How far may the proposed line of Canals tend to increase the cultivation of such jungly tracts as are near, or intersect their line of route?

5. What may be considered the average value of land per "cottah" on or near the line proposed for the Canals between Tardah and Koolnah?

6. What resources in number of men, could the Jessore district afford towards carrying on the digging of the Canals?

7. What is the common or average price of tank digging in the Jessore Districts?

8. Of what are the strata of earth composed at the following depths below the surface?

From the surface to 13 Feet.
From 13 to 18 ditto,
From 18 to 24 ditto,
From 24 to 36 ditto,
From 36 to 40 ditto.

This information may be obtained from persons who have been recently engaged in digging tanks.

9. What may be the annual number of boats lost between Tardah and Koolnah by the present route? and how far would Lieutenant Schalch's project tend to remove the dangers of the Sunderbun navigation?

10—1. What are the particular points at which losses are usually sustained in this navigation? or what proportion may the losses at each of those points bear to the whole loss between Tardah and Koolnah?

10—2. Are losses by robbery or depredations of any kind, extensive, in the route between Tardah and Koolnah? If so, do they occur at any particular points, and what number have occurred annually for the past five years, or from 1816 to 1820?

11. What is the period taken up in each month of the year in the passage from Calcutta to Koolnah, and vice versa?

12. What are the points at which detentions are generally experienced on the route? in what months are they most likely to happen? and what may have been the longest period of detention at such points?

Judge and Magistrate of *Jessore*.
Judge, and Magistrate of *Backergunge*.
Judge and Magistrate of 24 *Purgunnahs*.
Collector of *Jessore*.
Ditto, of *Backergunge*.
Salt Agent, 24 *Purgunnahs* Eastn. Divn. H. Hope, Esq.
Assistant Salt Agent, 21 *Purgunnahs*. C. Phillips, Esq.
Salt Agent, of 24 *Purgunnahs*, *Western Divn.* R. C. Plowden, Esq.
Salt Agent, of *Bulloah* & *Chittagong*, T. J. C. Plowden, Esq.
Commissioners in the *Sunderbuns*
Collector of Govt. Customs at *Dacca*.
Collector of Govt. Customs at *Chittagong*.
Mr. J. Fraser, *Superintendent of Embankments, Commercolly*.
Mr. L. Betts, *Superintendent of Embankments* 24 *Purgunnahs*.
Asst. Surgeon Lambe, *Dacca*.
Henry Mathew, Esq.
Mr. John Carter, Merchant at *Dacca*.
Mr. Wooden, Boat Agent, *Dacca*.
Mr. Geo. Boyd, near *Pubna*.

13. Would the communication with Calcutta at the back of the Circular Road, be deemed to possess advantages and inducements to the Sunderbun navigation, beyond those [of] the communication by Tolly's Nullah present?

14. Would the adoption of Lieutenant Schalch's route be likely to remove the aversion of the native boatmen to the Sunderbun navigation, and to become an object of preference over the old route? And, if so, what are the assignable causes to a preference beyond the mere difference in distance?

15. Can you detail the original dimensions in length, breadth, and depth, of Goodlad's Creek or Morrieson's Cut? And what was the expense incurred in making these Cuts? also what time was spent in their execution?

16. Are you enabled to detail the precise state of the last mentioned Cuts at any two, or three separate periods since their formation?

17. Do you happen to know if any annual sum has been expended in keeping these cuts in order? and, if so, what is the expense annually incurred?

18. What is the annual number of boats, and their tonnage, in maunds, insured in Calcutta for the Upper Provinces, or for the Eastern districts, which proceed by the route of Tolly's Canal and the Sunderbun passage?

19. What number of such Boats are annually lost in the Sunderbun passage?

20. 21. These two queries to be applied to trade insured at out stations, and received in Calcutta, by the same route; and the whole are required to embrace a period of five years, if practicable.

22. What is the usual period of a passage in each month of the year from Calcutta to the Ganges, and from the Ganges to Calcutta by the Sunderbuns?

23. To what extent does the dread and abhorrence, which the mangies and dandies (particularly those of the Hindoo Religion) are supposed to have of the Sunderbun passage, operate in raising the price of freight carried through it? Do their fears induce a demand for higher wages, or prevent any boats from being navigated by that route when the other passages are closed?

24. The difference of boat-hire, insurance, &c. charged on goods brought by the Sunderbuns compared with the usual rates, when conveyed by the Baugretty, Jellinghy, or Mattabhangah?

25. Would the adoption of Lieutenant Schalch's line of Canals through the Sunderbuns reduce the rates of freights and insurance? and to what extent per cent. might such reductions be expected to take effect?

26. What delay has heavy laden boats been known to experience, in stormy weather, in waiting a favorable opportunity of passing the heads of the large Rivers, particularly the Roy Mungle?

27. Is it likely to tempt boats, who now wait the opening of the Mattabhangah and Baugretty passages, to continue their voyage to Calcutta as furnishing a more safe and expeditious passage than the old Sunderbun passage?

28. What value should be attached to the formation of a basin or harbour for boats near Chitpoor? and what class and number of Boats would have recourse to it for protection om the Bore, &c. and at what Seasons?

*(Signed)* R. C. F.
*Secretary.*

## [1]E 4. *g*.

### List **No. 4.**

[1] Paper E. para. and 32.

## *On the direct Navigation between Calcutta and the Ganges, by the Hooghly, Mattabhangah, Baugretty, and Jellinghy Rivers.*

Lieut Col. Parlby, Engr. Superintende Embankments, *Moorshedabad.*
Committee of Embankments at *Moorshedabad.*
Do. Do. Nuddeah.
Commercial Resident. *Cossembazar.*
——Ditto——ditto, *Jungypoor.*
——Ditto——ditto, *Commercolly*
——Ditto——ditto, *Bauleah.*
——Ditto——ditto, *Maldah*
——Ditto——ditto, *Rungpoor.*
——Ditto——ditto, *Sonamooky( Surrool*
——Ditto——ditto, *Surdah.*
Judge and Magistrate, *Nuddeah.*
Collector, *do.*
Custom Master at *Moorshedabad.*
Mr. R. C. Blunt, *Shikaapoor.*
Mr. Harris, *Kishnagur.*
Mr. Faddy, *Bausburriah.*
Mr. J. Clark, *Bogwangolah.*
Mr. Save, *Coolbariah.*
Mr. Birch, *Jungypoor.*
Mr. Barnes, *Koostee.*
River Insurance Company.
Mr. J. S. May, Superintendent, &c. *Mattabhangah.*
Superintendent Embankments, Hoogly.
Do. *Rajeshahye.*
Mr. John Watson, *Furreedpoor* by *Moorshedabad.*
Mr. C. K. Robison, Calcutta.

1. Has the Navigation between the Rivers Hooghly and Ganges by either of the above passages been obstructed for boats of from three to five hundred maunds in the months of January, February, March, April, and May in each year?

2. If obstructed, in what particular month was the navigation closed to boats of such burthen? and how long did the obstruction remain in each year?

3. At what particular points on the line of communication did these obstructions exist? what were their nature? and what the lowest depth of water at such points in each year?

4. The navigation having been free during the months of January, February, March, and April, in some years, and closed in others, what causes can be assigned for such variations?

5. What measures have been resorted to, to keep open the navigation by these routes during the dry months? what expense incurred, and success resulted?

6. If the navigation has been obstructed, notwithstanding the adoption of measures to keep it free, were there, within your knowledge, remedies applicable to the evil, which may insure a prospect of permanent success? what might be the estimated expense of such measures for the attainment of this object?

7. What is the usual period taken up by boats passing from Calcutta to the Ganges in each month of the year? and what the period in passing from the Ganges to the Hooghly by either of the above passages?

8. Are you aware that the transport of merchandize has been delayed for the opening of the passage? and, if so, what were the articles of commerce which met such detention? and for what period it lasted?

9. Should the last question be resolved in the affirmative, can you assign any reason for such a preference to either of the above passages as may account for a detention, which might be shortened, by adopting the Sunderbun route to Calcutta, which is not closed at any season?

10. What depth of water has there been at the mouth of either of the above passages during the months of January, February, March, and April?

11. Are tnere any obstructions existing at or near the mouth of either of these rivers, and if so, of what nature?

12. Supposing a free passage has hitherto existed,—what measures would seem calculated to secure it so, and counteract the formation of obstacles?

13. Is the bed [of] either of these Rivers subject to changes? and, if so, to what extent have they occurred within your memory, or that of intelligent Natives around?

14. On the occurrence of changes in the bed of the Ganges,—what influence have they had on the mouth of either of these Rivers?

15. Could measures be adopted to counteract changes of this nature happening at either of the above passages? and what expense would be incurred in their adoption?

16. If either of the above passages has been navigable during one dry season and not another, what particular cause can be assigned for the variation?

17. It having been rumoured that the navigation of the Ganges between Bogwangola and the mouth of the Gurroy river at Koostee was peculiarly dangerous,—can you give any precise idea of the amount of loss sustained in this part during the months of February, March, April, and May? and can you state whether the losses sustained are of greater or less amount than those which happen within an equal space immediately above Bogwangola.

18. What is the annual number of boats, and their tonnages, in maunds, insured in Calcutta, which proceed to the Upper Provinces by the Hoogly and Baugretty Rivers, to the Ganges?

19. What number of such boats are annually lost between Calcutta and the River Ganges by this Route?

20. What is the annual number of boats and their tonnage, in maunds, insured in Calcutta which proceed to the Upper Provinces by the Hoogly and Mattabangah to the River Ganges?

21. What number of such boats are annually lost between Calcutta and the Ganges by this Route?

22. What is the annual number of boats, and their tonnage, in maunds, insured in Calcutta, which proceed to the Upper Provinces by the Hoogly and Jellinghy to the River Ganges?

23. What number of such boats are annually lost between Calcutta and the Ganges by this route?

24. What is the usual period of a passage in the dry and rainy season from Calcutta to the Ganges, and from the Ganges to Calcutta, by the Sunderbuns?

25. Within the last 20 years can you specify those during which the Baugretty, Jellinghy, and Mattabangah, have all been closed to boats of 500 maunds and upwards, and for how many days and months?

26. Are there any other outlets communicating with the Ganges through which a permanent communication with Calcutta might be established by either of the direct routes of the Baugretty, Jellinghy, or Mattabangah passages?

27. If such openings are to be found between Rajmahul and the mouth of the Jellinghy,—of what nature are they? and what are the facilities they present towards the object of connecting them with either of the last named passages? and what expense would be incurred by opening the cuts which would connect them with those Rivers?

*(Signed)* R. C. FAITHFULL,

*Secretary.*

## (1)E 4. *h.*

(1) Paper E para. 4. and 39.

### List No. 5.

## *On the Nature and Extent of the Trade under the influence of the Navigation to the Eastern and Western Provinces.*

Collector of Government Customs, Calcutta.
Collector of Tolls on Tolly's Canal } Collector of 24-Purgunnahs.
——,, do. Eastern Canal }
——,, do. of *Nuddeah.*
Custom-Master *Moorshedabad.*
Commercial Residents at { *Cossimbazar.* *Jungypoor.* *Commercolly.* *Sonamooky.* *Bareleah.* *Maldah.* *Rungpoor.* *Surdah.*
Collector of Tolls on the *Mattabangah.*
Collector of Government Customs at *Dacca.*
Do. *Chittagong.*
Mr. Phillips Assistant Salt Agent, Superintendent Eastern Division 24-Purgunnahs *Koolna.*
Salt Agent Western Division 24-Purgunnahs.
Do. *Bulloah* and *Chittagong.*
Do. Eastern Division 24-Purgunnahs.
Board of Trade.
Do.——Opium, Salt, &c.

1. What advantages appear likely to arise, from the execution of Lieutenant Schalch's Scheme, to the Trade and Communication with the Eastern Provinces?

2. Ditto, Ditto, Ditto, Western Provinces?

3. Of what Nature, and to what Extent, is Traffic now carried on between Coolna, on the Boirub River, and Calcutta, by the Route of the Sunderbuns and Tolly's Canal?

4. The annual amount of tonnage, in maunds, employed under your Agency or Residency,—with a specification of the size of Boats used, their period and routes of dispatch to the Presidency?

5. Statement of the gross amount, in maunds, of tonnage, annually employed in (embracing a period of 5 years, or from 1816 to 1820) bringing the Company's Investment to Calcutta,—shewing the periods of dispatch from the several Residencies or Agencies, and dates of arrival in Calcutta?

6. Description, Quantity, and Value of Goods, entered at the Berhampoor Custom House for Calcutta, during each month of the year (from 1816 to 1820 inclusive) with, if ascertainable, the channels by which the Goods have been conveyed?

7. Similar Quere with regard to Goods entered at the same Custom House, in progress to the Ganges.

From the Custom House or other authority at Nuddeah, relative to Jellinghy.

8. Description, Quantity. [and] Value of Goods, which pass down the Jellinghy River for Calcutta, during each month of the year (from 1816 to 1820 inclusive) with, if ascertainable, the Channels by which the Goods have been conveyed.

9. Similar Quere with regard to Goods passing up the Jellinghy to the Ganges.

From the Superintendent of Tolls on the Matabangah.

10. Description, Quantity, and Value of Goods, which pass down the Matabangah for Calcutta, during each month of the year (from 1816 to 1820 inclusive) with, if ascertainable, the channel by which the goods have been conveyed.

11. Similar Quere with regard to Goods passing up the Matabangah to the Ganges.

From the Durogha or other Custom House Agent at Tardah, Description, Quantity, and value of Goods by Tolly's Nullah; their place of produce, number and size of boats on which conveyed for five years, or from 1816 to 1820.

12. The same Quere to the Durogha, on the Balliaghat Khal.

13. What is the Tonnage in maunds, and what the rated value of the Traffic entered in the Calcutta Custom Department during the last five years, or from 1816 to 1820 inclusive, by the route of Tolly's Canal, or the Balliaghat Khal:—the Imports to be distinguished from the Exports?

14. What is the annual amount of the duties levied on this trade?

15. What are the principal and most bulky articles included in this Traffic?

16. What is the general tonnage of boats? and what the number annually employed in the trade carried on by this navigation?

The four last queries applied to the Traffic by the River Hoogly, to and from the Northern and Western Provinces, viz.

17. What is the tonnage in maunds? and what the rated value of the Traffic entered in the Calcutta Custom Department, during the last 5 years (or from 1816 to 1820 inclusive) by the route of the Hooghly to and from the Northern and Western Provinces:—the Imports to be distinguished from the Exports?

18. What is the annual amount of duties levied on this trade?

19. What are the principal and most bulky articles included in this Traffic?

20. What is the general tonnage of boats? and what the number annually employed in this trade carried on by this navigation?

21. What is the annual Import, in maunds, from the Eastward of Calcutta, in each of the following articles, viz.

Grain, Salt, Firewood, Chunam, Bricks, Charcoal, Pitcoal, and Timber?

22. What is the number of boats employed in these particular branches of trade? and of what tonnage are the boats severally engaged in it?

23. Description, Quantity, and Value of Goods entered at the Dacca or Chittagong Custom House for Calcutta, during each month of the year (from 1816 to 1820 inclusive,) with, if ascertainable, the channels by which the Goods have been conveyed.

24. Similar Quere with regard to Goods entered at those Custom Houses from Calcutta.

(*Signed*) R. C. F.
*Secretary.*

(1) Paper E. para 1. & 42

## (1)E 4. *i.*

### List No. 6.

### *On the Mercantile Advantages, resulting from the adoption of Lieutenant Schalch's Proposition.*

Messrs Steward and Robertson,
,, Hogue Davidson & Co.
,, Mercer and Co.
,, M'Clintock & Co.
D. Turnbull, Esq.
A. Glass, Esq.
Board of Trade.
Do. of Salt & Opium.
Lieutenant C. Paton.
H. Mathew, Esq.
G. Lambe, Esq. *Dacca.*
What is the usual difference of Freight, Insurance, & time, between Goods Imported and Exported via Baugretty, via. Jellinghy, via Matabhangah, and via Sunderbuns at*

1. What advantages, in a Mercantile point of view, are to be expected from rendering the Sunderbun passage more speedy and safe?

2. What value should be attached to the formation of a basin or harbour for boats near Chitpoor? and what class and number of boats would have recourse to it for protection from the Bore, &c. and at what Seasons?

3. What per centage would be considered reasonable, on the trade to and from the Western Provinces, to secure *direct* navigation at all seasons between the Ganges and Hooghly?

4. Is the Commerce of the City likely to be improved by a more ready Import passage from the Sunderbuns, by the convenient and commodious points for unloading the indispensable and bulky articles of consumption, such as Grain, Salt, Firewood, Chunam, Pitcoal,

and Timber? and what reductions in the prices of these articles may be expected to arise from the above named advantages?

5. What is the usual difference of freight, insurance, and time, between goods Imported via Baugretty, Jellinghy, Mattabangah, and Sunderbuns, at any and each different season?

6. The same Quere applied to Exports, via those routes.

7. What proportion of the Inland Exports and Imports of Calcutta, by the River Hooghly, may be referred to the Provinces *West* of Bogwangola?

8. The same Quere applied to the Provinces *East* of Bogwangola.

9. What proportion of the Inland Exports and Imports of Calcutta by the Sunderbuns may be referred to the Provinces East of Calcutta?

10. The same Quere applied to Exports and Imports with the Provinces to the *North* and *West* by this route?

*(Signed)* R. C. F.
*Secretary.*

any and each different Season.
What proportion of the Inland Exports & Imports of Calcutta, may be referred to the Provinces *West* of Bogwangola and *East* of the same point?
[☞ To the Board of Trade, & Board of Salt, Opium, and Customs.]
N. B. Trade that passes up and down the Hooghly only, that is which would not employ the Sunderbun passage or pass into the Ganges or Megna, may be omitted in the above.
*(Signed)* J. Y.

# E 5.

Resolution.—Agreed, That the proposed Suggestions be adopted, and that the several Letters of Inquiries, with their accompaniments, be forwarded accordingly, as soon as practicable.

# [1] E 6.

(1) Paper, E. para. 9.

## *The following Minute received from Capt. M'Leod.*

MINUTE.

Having been compelled by peculiar circumstances, to relinquish my station as a Member of the Special Committee on Lieutenant Schalch's proposed line of Canals through the Sunderbuns, and previously prevented from going into the details of the Scheme, to an extent satisfactory to myself, which might be expected from me, when nominated conjointly with others to deliberate and report on the subject referred to our consideration, I feel it a duty, on retiring, to lay before the Committee my sentiments on the subject, in a general and cursory manner.

On the Memoir first presented by Lieutenant Schalch, I had digested queries on points, which were not there sufficiently elucidated, but the production of his 2nd Appendix, has anticipated the explanations I should have required, in almost every instance.

Lieut. Schalch has treated his subject with so much perspicuity, ability, and candor, and has rested the proof of the positions advanced in support of the undertaking, on such solid and satisfactory grounds, while he has openly brought forward every objection that has been suggested to him by others, as well as every obstacle which opposed itself, as threatening to obstruct the accomplishment of his favorite design, and, by the most powerful argument, removed the unfavorable impressions they were calculated to excite on a first

view, that, to me, there seems no room left for discussion as to the practicability of his proposed line of Canals; unless indeed, which I think is not at all improbable, the *strata* in the general line, within the depths to be excavated, may be found to vary considerably from what has been predicted, and from those defined in the table inserted in his 2nd Appendix, and so produce effects on the sides or banks of the Canal, more destructive of their permanency than Lieut. Schalch has anticipated.

(1) Paper E. para. 21.

(2) Paper E. para. 17.

Taking for granted the accuracy of Lieut. Schalch's levels,[1] between the Salt Water Lake and River Hooghly, (and I confess, from the mode he describes as adopted by him to ascertain them, as well as the satisfactory proofs he has adduced, their accuracy is established, in my mind, beyond a possibility of doubt) I am of opinion that the proposition for cutting off the communication[2] between the River Hooghly and the Canal, in the Rainy Season, is not only judicious, but a measure of indispensable necessity, to guard against the effects of obstruction to the Draining of the City of Calcutta.

The mode suggested by Lieut. Schalch for effecting this object, although suitable in theory, would not, I apprehend, be found efficient in practice; it would be extremely difficult, if not impracticable, so to construct the proposed grooves for the reception of the ends of large beams, within the arch, as to admit of the beams being easily let down into them, and to fit well in; I would therefore propose, that, instead of having them constructed *within the arch*, they should be formed in the abutments, and centre pier extended a few feet beyond the Bridge on each side—by which means the beams could be let down into the grooves, by means of tackle from the top of the Bridge, with facility and effect, and removed again with equal freedom—in which case either the whole space between the beams, on each side of the arch, might be filled in with clay, or only a bank of clay within each, as might be found necessary.

After perusing the Memoir of Major Rennell of the 8th March, 1796, any doubts I might have entertained on the preference due to an attempt to establish a line of Canals, that would open a more immediate and direct communication with the Ganges, than that proposed by Lieutenant Schalch, are completely removed; the opinions of a person so eminent, and of such acknowledged talent and information on this subject, going so far to confirm the observation made by Lieutenant Schalch in support of his scheme, are justly calculated [to] inspire confidence in his statements and propositions.

It falls out of my province, to express any decided or satisfactory opinion, as to the probable value of such a line of Canals in a Commercial point of view; or as to the advantages they might afford to the City of Calcutta, but on this occasion I may be allowed to express my hope, that the information now collecting by the Committee on those points, may be of a nature to admit of its framing a Report, favorable to the execution of the design in all its bearings, and thereby reward the zealous, able, and unwearied exertions of the Projector, with that success which they unquestionably merit,

(*Signed*) D. M'LEOD,
*Captain of Engineers.*

CALCUTTA,
*October* 15, 1821.

# [1] E 7.

(1) Paper E. para. 5.

No. 124.

## TO THE SECRETARY TO GOVERNMENT.

Territorial Department.

SIR,

In the prosecution of its inquiries, the Committee for reporting on Lieutenant Schalch's Plans has found the obstructions to a free navigation by the route of Tolly's Nullah a source of very general complaint; and with the Boat Insurance Company, and the Boat Agents, this consideration has been pressed as one motive for an approval of the new line of Canals suggested by Lieutenant Schalch.

2. These objections to the present communication with the Sunderbuns could not fail to attract the attention of the Committee, and as its researches have hitherto proved so far favorable to Lieutenant Schalch's plans, that there is just reason to conclude the final Report will recommend their adoption,—it was pressed on the attention of the Committee at its meeting on this date, that great as was the inconvenience to the Trade of the City from the present obstructed state of Tolly's Nulla, this inconvenience must be much augmented when the excavation of the new line of Canals shall have been commenced on, between the Eastern border of the Salt Lake and the Baliaghat Canal; since the operation would, necessarily, close this communication with the Sunderbuns; and the bulky Articles of Fire-wood, &c. which reach the City by the Eastern Canal, must have recourse to Tolly's Nulla, thereby adding to the quantity of Tonnage passing through it; and augmenting the difficulties which now oppose a free navigation.

3. If the view here taken be correct, it is obvious that the clearing out Tolly's Nulla should precede the formation of a new line of Canals across the Salt Lake; nor could this operation be delayed to a distant period, should the new line of Canals be found impracticable or inexpedient, because in this latter case there would be a more urgent necessity for improving the navigation of Tolly's Nulla, which would then remain the only channel of communication between the Sunderbuns and the River Hooghly.

4. Upon such grounds, I have been instructed to address you on this subject, and, in requesting you will bring the matter under the consideration of Government, the Committee feels assured that His Lordship in Council will not disapprove of advertence to the question, although not immediately within the scope of its defined duty, from the importance, which, with reference to season, must attach to an early decision on the points placed at issue; should the expediency of adopting immediate measures for clearing Tolly's Nulla be concurred in by Government, the employment of Lieut. Schalch on this duty appears to the Committee, fraught with considerable advantages to the future prosecution of the line of Canals, which that officer has suggested, by adding to his extensive theoretical acquirements, a degree of practical information—which is essentially necessary in the conduct of so great an undertaking.

5. In recommending Lieutenant Schalch to the attention of Government for the above duty, I am, in conclusion, to suggest, that he be, in the first instance, called on to prepare a Report on the present state of Tolly's Nulla, and to submit an estimate of the probable expense which will be incurred in clearing its bed and repairing its banks for the consideration, of His Lordship in Council.

SECRETARY'S OFFICE,
CHOWRINGHEE, No. 30,
*2nd February*, 1822.

I have the honor, &c.
*(Signed)* R. C. FAITHFULL,
*Secretary Special Committee, Lieut. Schalch's Plan.*

## (1) E 8.

(1) Paper E. para. 89.

No. 125.

To H. MACKENZIE, ESQ.

*Secretary to Government.*

Territorial Department.

SIR,

We have the honor to submit to Government the accompanying copy of a Letter received from our Secretary, Captain Faithfull, soliciting to be relieved from the duties of Secretary to our Committee, in consequence of his approaching departure from the Presidency.

2. The Members of the Committee have every reason to be entirely satisfied with the zealous and able manner in which Captain Faithfull has performed the duties entrusted to him.

3. He has obtained and consulted with the greatest diligence various documents both of a private and official nature, which were calculated to throw light on the subjects referred to our consideration; he has sought information from numerous individuals, and he has been thus enabled to digest and arrange, in a very clear and satisfactory manner, a series of questions which appear to embrace every important point, either of a scientific or local nature, connected with the plans on which we shall have to report our sentiments to Government.

4. These questions have been widely circulated, and on the receipt of such replies as have not yet been furnished, little will remain but to digest the substance of the voluminous Documents before the Committee, and subsequently to prepare the Report.

5. The full knowledge which Captain Faithfull possesses of the subject, in all its bearings, and of the sentiments entertained by the several Members of the Committee, would enable him to prepare the Draft of the Report, with great comparative facility and advantage, but even to him, it would be a work requiring considerable time and attention. None of the Members of our Committee are likely to have sufficient leisure for the purpose; and it was our intention, upon these grounds, to have suggested to Government the expediency of some other duly qualified gentleman being nominated to act as Secretary to our Committee.

6. His Excellency, the Commander-in-Chief, however, having since the receipt of Captain Faithfull's letter, been pleased to remove that officer from the situation of Major of Brigade at Dinapore, to a similar situation at Berhampore, we were unanimously of opinion,

that the objects for which the Committee has been appointed might be better secured by retaining the services of Captain Faithfull, than by the nomination of another officer to be our Secretary.

7. We propose that the ordinary correspondence of the Committee be carried on at the Presidency by ourselves, that copies of the correspondence and of the answers to the questions already circulated be regularly furnished to Captain Faithfull at Berhampore, that the result of our deliberations be communicated to him, and that he should then prepare the Draft of the Report to be eventually submitted to Government.

8. Captain Faithfull having expressed his cheerful acquiescence in the proposed arrangement, we beg to solicit that it may be sanctioned by Government.

9. We shall hereafter submit to the favorable consideration of Government our sense of Captain Faithfull's claims to a suitable pecuniary compensation.

*The Committee Adjourned.*

We are, &c.

(*Signed*) W. B. BAYLEY,
" H. SHAKESPEAR,
" H. MORRIESON, *Captain.*
" G. J. GORDON,
" R. C. FAITHFULL, *Captain.*
*Secty. Spl. Com. Schalch's Plan.*

CALCUTTA,
*6th February*, 1822.

# E 8. *a.*

No. 122.

To W. B. BAYLEY, ESQ.
*President, Special Committee Lieut. Schalch's Plans.*

SIR,

The arrangement in Government General Orders of the 18th ultimo, announcing promotions in the department of Adjutant General of the Army, vice Stuart, proceeded to Europe, having annulled the Officiating appointment I held in it, and the arrangement by the Commander-in-Chief, in General Orders of the 26th instant having defined the period of my detention at the Presidency as an officiating Assistant Adjutant General, I lose no time in communicating the circumstance, in order that a successor may be nominated to the Office of Secretary to your Committee.

During the few days that will precede my departure from Calcutta, for my station, Dinapoor, there will be so much to occupy my time and attention, that I solicit your exertions to procure an early relief from the duties of Secretary.

I have the honor, &c.

(*Signed*) R. C. FAITHFULL,
MAJOR BRIGADE *Dinapoor and*
*Secty. Spl. Com. Lieut. Schalch's Plans.*

SECRETARY'S OFFICE,
CHOWRINGHEE, No. 30,
*29th January*, 1822.

1) Paper E. para. 5.

## (1) E 9.

### To CAPTAIN R. C. FAITHFULL,

*Secretary to the Committee for the Reporting on Lieutenant Schalch's Plans.*

Terrl. Dept. Revenue.

SIR,

I am directed by His Excellency the most Noble the Governor General in Council, to acknowledge the receipt of your letter dated the 2nd instant, and to request that you will inform the Committee, that, as suggested by them, Lieutenant Schalch will be instructed carefully to examine Tolly's Nullah, and to prepare a full report on the present state of that Nullah; submitting at the same time an Estimate of the expense likely to be incurred in clearing its bed and repairing the banks.

I am, &c.

COUNCIL CHAMBER, (*Signed*) HOLT MACKENZIE,
*8th February*, 1822. *Secretary to Government.*

## E 10.

### MINUTE.

### BY G. J. GORDON, ESQ.

I wish Lieut. Schalch had been content to entitle his Memoir, "A Plan for facilitating the Inland Navigation between Calcutta and the Eastern parts of Bengal; and forming a safe and convenient harbour for the Inland Trade generally." To this extent the utility of the proposed improvements seems to me unquestionable, and their importance great; but, as far as I have been able to learn, their value, as facilitating the navigation to the Western Provinces, is but trifling and secondary, and even quite nugatory, when compared with the object of preserving open the Channels by which alone the Up-country Trade can be properly said to have been hitherto conducted. I take it for granted, that if all the Cuts proposed by Lieut. Schalch, are found both practicable and safe, they will not render the passage from Koolna materially quicker than it generally is at present, though they may evitate those causes of extraordinary delay, that sometimes occur. If this be the case, the Sundurbun passage from the Upper Provinces will still be more tedious than that by the Bhagrutte, and 15 days longer than that by the Mattabhanga, when these channels are fully open. This difference in the time required to bring his goods to market is frequently of the utmost importance to the Up-country Merchant, more particularly when he has contracted to deliver his goods in Calcutta by a certain date, or when ships are waiting to convey them to their ulterior destination, at the risk of losing the favorable season for a prosperous voyage.—As an instance of the delay arising from the closing of the upper channels, I may mention, that in 1820 Messrs. Mercer and Co. directed their agents at Bhugwangola to detain their Cotton boats, which arrived there on the 22d

of May, till the Matabhanga should open, rather than send their goods by the Sundurbun passage. Those larger boats which sailed a week afterwards, reached Calcutta about the same time as other boats of small dimensions, on board of which some Cotton was dispatched from the same place by the Sundurbuns. On the 28th of April, or upwards of a month before, when the Bhagruttee channel is quite open, as in the rains, boats with 250 bales of Cotton come down in 8 or 10 days, when they would take a month to come by the Sundurbuns. Besides this loss of time the expence is nearly double the hire of Boats from Bhugwangola,—by the Bhagruttee being 10 or 12 Rupees per 100 maunds, by the Matabhanga 9 or 10 Rs.,—but by the Sundurbuns Rs. 24 or 25. This difference in as far as it depends on those obstacles, which the present plan is calculated to remove, will no doubt be diminished in a certain degree, but must ever continue considerable, so long as there is half a month difference in the time required for the voyage; and also while that part of the Ganges which lies between Bhugwangola[1] and Koostee, is subject to those North-Westers, or rather Hurricanes, which almost every year prove fatal to great numbers of boats proceeding to the Sundurbuns or lower parts of Bengal. We may at all events safely predicate that there is no more probability of the Sundurbun passage being resorted to by Up-Country Traders, in preference to the other Routes, than that Luckipore and Baqurgunge Boats should take the Sootee Route in preference to the Sundurbuns. There is no doubt a great deal of truth in the observations quoted by Mr. Schalch, to shew the little likelihood of any new Cuts from the Great River remaining permanently open:—this is strikingly displayed by the present appearance of the upper part of the Delta of the Ganges, as far to the South at least as the Town of Jessore. This tract of country is every where traversed by serpentine indentations, some full of beautiful sheets of water, the remains of former rivers, others mere hollows, which, though now only full during the rains, have evident marks of the same origin. I am also inclined to agree fully with Mr. Schalch, that, within the range of the tides, water-courses are much more permanent in their form and depth, than beyond that extent; and my own observations led me to the very same conclusion as to the circumstances that affect the depth and width of Nullahs in different parts of their course. I have invariably found with him, that where the bank is of a nature to oppose strong resistance to the lateral action of the current, there the channel is deep; and in a reach, where the banks are of sand, the River is broad and shallow. This however seems to me to lead to the conclusion, not that all Cuts that increase the rapidity of Rivers are likely indiscriminately to prove injurious to their navigation, but only that care should be taken to make them where the soil is hard and strong, and never though [through] sandy soil of considerable declivity. It should be remembered that the rapidity of a stream, through any given space, depends principally on the absolute fall betwixt the extremities of such space, and not on the rapidity with which the water either enters it at one extremity or is discharged at the other. A Canal may be filled from a Cascade, and the superfluous water carried off with equal velocity by a weir over its bank, without any perceptible, though some real motion in the body of water contained in the Canal. In the same way if a Cut be made of 1000 yards, that shortens the course of a River by a distance of 2 or 3 miles, there will be a great fall, and consequent rapid current, through that Cut—but the change of rapidity above or below will be only in a degree almost imperceptible; arising in the part above the Cut from a slight depression in the surface of the water; and below the Cut from a similar elevation at the place next either extremity of the Cut respectively. To illustrate this further we have only to consider the instance of a mill pond of which the banks may be of sand, without any danger of their being affect-

(1) Paper E. para. 47

ed by the rapidity of the current entering, or of that issuing from it. If the sluice be firm there is no danger of any other part giving way from that cause. The Koomar River, which gives off the branch called the Matabhanga below Kachikatta, was this year almost entirely obstructed at its mouth, where it flows through a sandy soil, but was, in most parts of its course below Kachikatta, where it retains its name of Koomar, and flows towards the Gooray, through similar hard soil, fully as deep as that River—At one place, at a perpendicular bank of indurated clay, nearly as hard as slate, I could not touch the bottom with a bamboo 18 feet long; the bank above the level of the water being at least equally high. If therefore a Cut could be made through firm ground, which should convey the water of the Ganges with rapidity into the Bhagruttee, there is no reason for apprehending that this would be attended with any other effect on the bed of that part of the river below the place where it entered, than that of raising or heightening, if I may be allowed the expression, the level at which the water in the channel would stand, in the same way as a mill pond is filled by admitting a current from above. How little the general rapidity of a River, whose course extends for upwards of 200 miles below the point where it receives its supposed accession of water, is likely to be affected by a rise even of several feet at that point, requires no calculation to shew. That efforts to preserve the navigation of a River open, by attention to its head, are not altogether inoperative, has been proved by actual experience at the Matabhanga. It was not till extensive sand banks had been formed at the head of the Koomar by sunken boats and rafts of timber, that the Matabhanga became at all obstructed, and the channel remained open all the way to the Hooghly, so long as the Superintendent was able to preserve a passage from the Ganges through the sands. That the obstructions which take place at the heads of Rivers have no necessary connexion with the height which the Ganges maintains in the dry season, may be inferred from the fact, that last season for instance, while the Bhagruttee remained open for large pinnaces, the head of the Jellinghee was closed by a sand bank 2 or 3 feet above the level of the River, and the Koomar had not 6 inches of water at its head. I believe too, that on inquiry it will be found that the Bhagruttee and Jellinghee have always been navigable throughout their course, during the seasons that the heads of those Rivers have been open, and that it has frequently happened in former seasons, that the Jellinghee has been open while the other was shut, and vice versa. I do not pretend to say that accidental obstructions in the course of a River may not be formed far below its head by sand banks, which owe their origin to sunken boats, &c.; such partial obstacles however may always be overcome, and with due attention prevented from recurring. Agreeing with Lieut. Schalch that a current passing rapidly through a sandy soil, spreads and does not cut deep, I confess I am at a loss to understand on what principle he apprehends danger to the navigation of the lower parts of the Hooghley, from increasing the rapidity of the current in the higher parts of the River. The rains are the only season that the Hooghley carries suspended in its waters any notable portion of sand or clay, and during that period when the whole country about Sootee is one sea, Cuts can have no material effect in increasing the flow of water into the channel of the Bhagruttee; this I apprehend depending exclusively on the difference of level—of course the greater the extent of head, or the greater number of channels by which water is conveyed towards the head of the River, the more nearly will the water in its channel be kept to as high a level as that of the Ganges, and consequently the *less rapid* will be the discharge from the Ganges into the Bhagruttee, and the less sand will be held in suspense by that water. The very fact that accumulations of sands are apt

to be formed at the heads of those branches, shews that the waters of the Ganges are particularly stagnant at those points from which they issue. From these remarks I mean to infer that where Cuts are made through hard soil they may be both safe and permanent, and that during the season when their operation in affecting the quantity of water in the channel is alone perceptible, there is no danger of producing by this means such increased rapidity in the streams as can possibly affect the navigation of the lower parts of the River. The utility of such Cuts while they can be kept open, so as to preserve the navigation uninterrupted, no one will question.[1] It therefore remains only to be determined, whether there is any point from which a Cut from the Great River into the Bhagruttee can be made, which shall be likely to be permanent, and of which the expense will not exceed such a sum as the trade, for which it serves as a channel, will, by an easy impost, amply reimburse.—Without an actual Survey, it would be rash to trust to the general and loose information to be obtained from Maps prepared without attention to this specific point,—but judging from such materials as we have, the spot at Rajhmahul, adverted to by Mr. Schalch, seems a very favorable one for the commencement of such a Cut as is required. The Ganges has never in the memory of man failed to flow with a deep and rapid current towards that point, from whence a very short Cut would lead to the back of the Town, and the commencement of a series of Jheels that extend half way to Sootee—from the Southern extremity of those Jheels some water-courses, navigable in the rains, though almost stagnant, might probably serve, with a little deepening, to connect the Cut through the Jheels with the Bhagruttee—I therefore conceive it would be of material importance to obtain an accurate Survey of the Country between Rajhmahul and Sootee, in which the levels and kinds of soil should be fully noted. From this an accurate Estimate of the expense might be easily formed; and our previous inquiries into the Quantities and Qualities of the Goods brought from the Districts, whose produce is generally conveyed through the Bhagruttee, would enable Government to come to a conclusion as to the expediency of such an undertaking. Should it be found, on examination, that advantage could not be taken of the Jheels and very low Country, without carrying the proposed Cut through occasional tracts of sandy soil, I should not consider this as a very material objection, having frequently observed that in pretty large Nullahs even a puckah Ghaut or other substantial obstacle is capable of protecting a considerable line of bank, formed of very mouldering soil, and the expence of such works would be amply reimbursed in cheapness of digging at those places.

(1) Paper E. para. 3

*(Signed)* G. J. GORDON.

# E 11.

*Contai, 28th September,* 1821.

MY DEAR SIR,

I have been apparently remiss in not before acknowledging the receipt of your favour of the 30th ultimo, and affording you the information therein requested respecting Canals, but I have been a good deal pressed this month to clear matters of business preparatory to the Doorgah Holidays, when my Cutcherry generally closes for a month.

The Canals you mention are the Banka Nullah, Narainpore and Koonjoopoor Khals. The Banka Nullah is under Tumlook, and I have had no opportunity of becoming ac-

quainted with the charges incurred on it annually, but what I do know of it, I will state under the separate heads you have mentioned :

1. The advantages to the public.

2. Whether it connects together Rivers or branches of Rivers.

3. Whether the tides flow through them.

4. Whether they require frequent and expensive repair.

5. Whether they produce any net revenue to Government.

6. Net revenue to Government—error—excuse this. Whether their Navigation is frequently obstructed.

7. I imagine they have all been excavated at the expence of Government, and chiefly for the convenience of the Salt.

### BANCA NULLAH.

2. It connects the Roopnarain with the Taingracolly and Huldye River, the former being the name it is called by at the Western end, by which it enters the Cossye River, in the Midnapore district; the latter the name of its Eastern end, by which it enters the Ganges a little above Kedjeree—that is the Taingracolly and Huldye is only the same River.

1. Its advantages to the public are generally these :—from Calcutta, it affords a safe communication, in blowing weather, with Midnapore through the Cossye, and with this District down along shore from the Huldye to a little above Kedjeree, where the Koonjapore Khal affords further safety to the Russoolpore Creek, whence through the Narainpore (called by us the Meerzapore,) Khal boats can pass to the Solah Mohun, about 4 coss to the Southward of my habitation, thus saving all the dangers in the South-west monsoon, which are to be found between the James and Mary and the Solah Mohun.

From this District again it affords a comparatively safe passage to Calcutta by going down by Roopnarain; and to the Burdwan part of the country, by going up that River; and, as it runs through the very centre of the Tumlook agency, its advantages both to the Salt Merchants and to the Company in the transit of Salt by the former, as well as to the Government Golahs must be essential.

3. Whether the tides flow quite through it, I cannot say decidedly, but I should suppose they do, since the flood running up the Huldye, must enter its Southern end and that up the Roopnarain its Northern end.

7. The original excavator was a [A] McKeble, father of the Colonel now in India, who undertook it for the sake of individual advantage by Toll; the conditions under which the undertaking was carried into effect I do not recollect, but I think the records of Government between 1799 and 1803 will give you a full insight into the nature of the whole transaction, for I think within that period McKeble's sons brought the matter before Government with a view to some adjustment of accounts.

### KOONJOOPORE.*

2. Connects the Ganges with the Russoolpore Creek from above Kedjeree.

1. It saves the outside passage from above Kedjeree to Russoolpore, and that dangerous part round Kedjeree point, and downwards past the Light House.

3. The tides flow through—running in and out at both ends.

4. Annually—the sand usually accumulating in the middle: from the opposing force of the flood tides, which run in at each end.

5. The following is a statement[1] of the Khal account from 1809 to April 1821 inclusive. (1) Paper E. para.

| | | | |
|---|---|---|---|
| Toll collected. .. .. .. .. .. .. | Sa. Rs. | | 8,309 0 0 |
| *Charges.* | | | |
| Excavation, .. .. .. .. .. | Sa. Rs. | 10,199 | |
| Establishment, .. .. .. .. .. .. | | 1,756 | |
| | | | 11,955 0 0 |
| Net Loss to Government, .. .. .. .. | Sa. Rs. | | 3,646 0 0 |

6. It is not obstructed, except when under excavation.

7. It was so, and more immediately for the benefit of the Salt Merchants and the transit of the Salt from the Aurengs to the Golahs; but it is now used generally, and is a great advantage in the South-west Monsoon; indeed I do not consider the above Sum to be an actual loss to Government—for if the Salt Merchants had to go the outer passage in the blowing season, the additional risk would affect the sale prices, and a single rupee per maund would, in one season, be a loss to Government, of more than the aggregate of the charges from 1809 to 1821 inclusive, as above stated.

NARAINPOOR OR MEERZAPORE.

2. Connects the Russoolpore Creek with the Solah River, at its entrance, I may say, into the Bay.

1. It saves the outside passage from the mouth of the Russoolpore Creek to that of the Solah.

3. & 4. Exactly, as under Koonjoopore,

5. From the same period as under Koonjoopore.

| | | | |
|---|---|---|---|
| Toll collected. .. .. .. .. .. .. | Sa. Rs. | | 10,061 0 0 |
| *Charges.*[2] | | | |
| Excavation, .. .. .. .. .. .. | | 2,863 | |
| Establishment. .. .. .. .. .. .. | | 1,861 | |
| | | | 5,724 0 0 |
| Net Gain to Government, .. .. .. .. | Sa. Rs. | | 4,337 0 0 |

(2) Paper E. para. 13.

6. & 7. As under Koonjoopore, except with reference to the concluding remark, which would have been equally applicable, had the result been a loss.

By deducting the loss from the gain, you will find that there is the trifling gain to Government on the whole of about Sa. Rs. 700 in about 12 years; so that you may say Government lose not, but the public gain essentially by the safety and convenience the Khal in question affords, at a season of the year, when the passage from the James and Mary down the Ganges to the Solah Mohun, is extremely dangerous and uncertain. The certainty of the inner passage, with reference to time and the saving of demurrage, and other charges, is a great advantage to the Merchants, whether, Salt, Grain, or any other article of commerce or common traffic, and the advantage to Government may be contemplated through the sale prices of the Salt sold periodically.

If I have not been sufficiently explanatory, make any further inquiries you wish, and I will, with the greatest pleasure, reply to them to the best of my knowledge and means of information.

Accept my best acknowledgments for your attention to my little present to the Asiatic Society, and believe me,

My dear Sir, to be,
Very sincerely yours,

*(Signed)* W. B. BAYLEY, ESQ. *(Signed)* C. R. CROMMELIN.

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(1) Paper E. para. 6.

# (1)E 12.

To CAPTAIN R. C. FAITHFULL,

*Secretary Special Committee on Lieut. Schalch's Plans.*

SIR,

I have the honor to acknowledge the receipt of your letter, No. 33, of the 27th Ultimo, together with the Plan and Memoir therein alluded to, and now have pleasure in forwarding my reply to those Queries which observation and experience have enabled me to answer.

Never having personally inspected the country through which the proposed Canal is intended to run, from the Salt-water Lake to Koolnah, it would be improper for me to pass my opinion on that part of the Plan.

I have the honor, &c.

(Signed) C. PATON, *Lieut*

*A. S. P. B. I. P.*

CALCUTTA,

*5th December*, 1821.

(2) Paper E para. 11

# (2)E 12. *a.*

List **No. 1.**

2. In all the large Creeks of Saugor Island, which are influenced by the ebb and flood tides, the banks appear generally uniform, and not injured by the action and reaction of the tide, and I should think a Canal within the influence of the tides, much less liable to injury in its banks (if sufficiently sloped) or obstructions of the passage from depositions of sand or mud, than in the higher parts of the Delta; yet I am of opinion that wherever the Canal may be intersected by a River, containing a larger body of water than itself, that the junction will occasion a sand bank.

3. & 4. The dimensions of the track ways ought not to be less than 60 feet, and whatever breadth the Canal may be, the slope of its banks should not be less than 2 feet to every foot of perpendicular height, or in other words, an angle of 30 degrees, which will entirely obviate any danger that may be anticipated from the stratum of sand subsiding and injuring the banks. The slope being great, the pressure upon the sandy stratum will be much reduced, and at the same time the force of action and reaction of the tides against its banks much diminished.

6. When the Cut executed by the late General Garstin, (ten years ago,) was proposed, strong apprehensions were urged (which will be found in the records of Government,) of the danger of sweeping away the City of Moorshedabad, but no such encroahment did take place during the short period of two or three seasons that the Cut remained open; and

I should think if the Canal be properly bunded during the freshes in the rainy season, a sand bank at the Canal's junction with the Hooghly is the only injury to be expected.

The plan[1] proposed by Lieut. Schalch for bunding out the river appears well suited for the purpose intended. (1) Paper E. para. 17.

8. The levels[2] taken by Lieut. Schalch are I believe perfectly correct, as may be seen from the results, the circuitous ones agreeing with those taken backwards and forwards on the same line. (2) Paper E. para. 21.

9. I am not aware of any better site for the basin than the one selected by Lieutenant Schalch.

*(Signed)* C. PATON, *Lieut.*
*A. S. P. B. L. P.*

# E 13.

To CAPTAIN FAITHFULL,
*Secretary to the Special Committee.*

SIR,

I have the honor to acknowledge the receipt of your letter dated the 27th Ultimo, accompanied by a set of Questions regarding the proposed Canal therein mentioned, and by a Map of the country through which it is intended the Canal shall be cut. Though I do not feel myself qualified to give answers to all the Queries, with the precision wished for, I will nevertheless endeavour to give to the Committee my sentiments in a general way, and beg they may be considered rather as communications in my private capacity than in my official situation; for, although I have had much experience as a Geographical Surveyor, I have little to aid me in most of the points in question, which can be better decided on by Engineers as such.

2. I have perused with attention the Memoir of Lieutenant Schalch, and think his arguments are stated with a degree of clearness, which evinces a due knowledge of his subject, and to my apprehension they are convincing.[3] I have a high opinion of his abilities, and think that the experience he has gained in the Survey of the Sunderbuns, enables him, better than any other person, to appreciate the facilities and difficulties of the proposed undertaking. I see no reason to question the accuracy of the levels,[4] the checks, levelling forwards and backwards described in the Memoir, are I think sufficient to prove their truth. But should doubt remain, I think it might be cleared up, at no great expense, by cutting an experimental Ditch, of small dimensions as practicable, from Chitpoor to and through the Salt-water Lake; for it appears to me, that by that line or by Tolly's Nullah the communication with Trandah [Tardah] must be made; but certainly the former, if no danger to the City of Calcutta be apprehended, appears by far to be the best—still, the possibility of such an event, is an important question, and though the cutting a Ditch, as I have mentioned, is rather an awkward method of proof, it would be a safe and convincing one,—for supposing that the outlet from the Hooghly, as proposed by Lieutenant Schalch, be closed in the Rains, the small body of water which would, in the dry season, be admitted into the experimental Cut, would be easily managed; but on this, as well as the consideration of the slope to be given to the sides of the Canal, and the questions regarding the nature of the soil, the estimates of the expenses, and several other queries, which can be better

(3) Paper E. para. 11.

(4) Paper E. para. 21.

answered by professed Engineers:—I must beg to be excused from giving any professional opinion on those parts of the subject.

3. But whatever method be adopted in making the communication from the Hoogly to Tandah. [Tardah] I think it will appear to every person, that the proposed line from thence to Kulna, is the safest and best, as avoiding the dangerous navigation of the lower parts of the Sunderbunds, provided the soil through which the Cuts are to be made, shall be considered to have the properties required, and this may perhaps be best discovered by experiment in any early stage of the undertaking.

4. In a great undertaking, something must be left to hazard—and to apply Rules applicable to the nature of the other soils, to that of the Soonderbunds, may be reasoning on false premises; but I think if one of the shortest required Cuts, as that across the neck of the land near Nardee, in an East and West direction, were made, joining any two of the Tideway streams, which flow nearly North and South, it would clearly prove the practicability or otherwise of the rest of the desired work; but such a Cut ought to be, I think, of the full size required for the navigation.

5. Such a Cut would probably, in a short time, very much resemble one of the natural East and West or perpendicular Reaches, which, in some instances, connect the North and South branches—and the Tide would flow into it in the same manner; the banks would acquire the same natural slope; and I apprehend the depositions of sand and mud would affect each nearly in a similar way; and it does not appear that such depositions are made in the Sunderbunds Rivers in the same uncertain and sudden ways, as in the Rivers where there are no Tides;—this is shewn by experience in the instances of Goodlad's Creek and Morrieson's Cut, and the reasons are already stated by Lieut. Schalch, and if they (backed by the proof of the permanency of these two Cuts, and the strong facts stated by Lieut. Schalch, that he found in his Survey that the small Nullahs near the line of the proposed Canal were nearly in the same state, as when surveyed by Major Rennell) are considered valid reasons, as I think they are, they hold forth strong arguments in favor of making the Cut rather on the proposed line than from the upper parts of the Baugretty River.

(1) Paper E. para 38.

With regard to the project of making a Cut from the Ganges at Rajhmahl, I do think there are strong objections to it. Whoever has contemplated the imposing and almost awful appearance of the river in the height of the rains, when it has an expanse of several miles, and rushes on impetuously with an increased depth of 32 feet, and charged with sand and mud to the extent of one-fourth part of its volume, will be apt to apprehend that any attempt made by the art of man to guide the might [mighty] stream according to his will would be unavailing. The fall of the river between Pointy and Rajhmahl is very great; in some places the banks are always falling in, and sand banks and islands are formed and washed away in a short time; and below Rajhmahl, though perhaps the current is not quite so rapid, the river is very wild, the banks are friable, and continually crumbling and shifting, what reasonable assurance, then could there be, that the mouth of a Cut made in the West side of the river *below Rajhmahl* might not in a season be filled by the mass of mud and sand carried in a weighty column of water of 32 feet of increased depth? Or what assurance could there be that in one season the wayward stream might not desert the head of the Cut altogether.

7. The Ganges once washed the walls of Goar. In the time of Major Rennell it was far distant from them, but is again I think encroaching on its bank on that side. But

it is needless to insist, on what will have occurred to every traveller by water, that above and below the neighbourhood of Rajhmahl, the bed of the River shifts much, and that the stream has an unmanageable character.

8. It seems to be apprehended that the velocity of the current in the proposed Cut, will be too great; laying aside the question of what it might probably be in the rains, as it is not intended that the Canal shall then be open, I do not think that the rapidity at other times of the year is likely to do injury. I perfectly agree in [the] justness of the statements made in Lieutenant Schalch's Memoir on the subject of the velocities of streams; the facts are, in my opinion, confirmed both by Theory and Experience, and it appears evident, that rapidity is due much more to be* [the] depths of Rivers than to the inclination of their beds.

9. In the instance of the Ganges we all know that in the dry season the current does not, on the average, flow faster than 2½ miles per hour, and in the rains it may 5 or 6,—yet the actual difference of level, in the two seasons, is not, at Cawnpoor, more than 15 feet I believe; an inclination surely insufficient to account for the increased rapidity. Major Rennell attempts to account for the rapidity by saying, the impetus is communicated from the spring head; it is true that at the head of the Ganges the velocity and fall are surprizing, for, in the upper 11 miles of its course beyond Gungoutre, I found the fall to be no less than 228 feet per mile, and from thence to Hurdwar, there are many falls; but between them there are deep pools, where the water is almost placid, and in the neighbourhood of Hurdwar, though there be several considerable rapids, they are divided by deep and almost still reaches, in which the *supposed* original impetus cannot possibly act. But it is useless to endeavour to account for the fact, for such it appears to be, that it is depth, and not merely descent, which chiefly communicates velocity; all we have to do, is, I think, to remember that both the depth and breadth of the Canal, will be inconsiderable, and those causes of velocity will not act powerfully: besides the Cut is not intended to have a course exactly parallel to the River.

10. If the mouth of the Cut were opposed to the direct current of the River, no doubt the water in it, would, for some space, retain nearly the same rapidity as the great stream, but if it be made at right angles to the River, the case would be different, and indeed, if *too great* velocity were apprehended, it might, I think, be checked by giving the Canal, for the *first half* mile, a few easy spiral turns in directions rather opposed to the line of the Hooghly; and they would form safe Harbours for Boats; and at their termination, I think, the barriers intended to exclude the River, in the height of the Rains, might be safely placed.

11. Major Rennell states the descent of the Bed of the Ganges to be 4 inches per mile.—It may be so, in some places, probably in those in which he took partial levels, but I strongly incline to believe that the *average difference* of level, from Hurdwar to the sea, is, by the windings of the Stream, nearly nine inches per mile, in some places it is more, and in others less—nay! there are some Reaches, particularly between Buxar and the mouth of the Gogra, in which, paradoxical as it may appear, I suspect, there is no, or at least a very small difference—indeed those Reaches have directions opposed to the general fall of the Country, and to the line which the River naturally affects, i. e. to the South-east; yet through them the Stream flows by virtue of its previously accumulated and acquired rapidity.

12. In the rains of 1819, on my way to Cawnpore by water, I made some Barome-

trical* Observations for my own amusement; as they may perhaps throw some light on this subject, I do myself the honour of sending them. It is obvious that the modes used, are only approximations, yet, as the results, varied and checked in so many ways, do still give nearly the same average fall to the Ganges, I think they may be interesting to the Special Committee, and the notes and explanations will, I hope, be satisfactory.

I have the honor, &c.

SURV. GEN. OFFICE, FORT WILLIAM, 14th December, 1821.

(Signed) A. HODGSON, *Surveyor General of India.*

(1) Paper E. para. 6.

# (1)E 14.

To CAPTAIN R. C. FAITHFULL,

*Secretary to the Special Committee on Lieutenant Schalch's Plans.*

SIR,

In acknowledging the receipt of your Letters of the 27th of November and 3rd ultimo, I am to apologize for the delay in replying to them. A delay which arose at first from illness, and afterwards from Official avocations: searching for notes on subjects of this kind long mislaid, and the time requisite to meditate on a plan of such magnitude as this of Lieutenant Schalch's, and on which I feel myself very incompetent to decide, having no local knowledge of the country through which the line of Canal is to pass, and must be guided by the information obtainable from Lieutenant Schalch's Memoir.

(2) Paper E. para. 32.

(2)From this Memoir, and from general Report, I find "That most of the Rivers that branch off from the Ganges are, in the months of January, February, March, April, and May, too shallow for large Boats." This must be so detrimental to commerce that great credit is due to Lieutenant Schalch for suggesting any mode by which such an evil so serious, may be remedied. But having (as I have already said) no kind of knowledge of the country or of the nature of its soil, it is not for me, (in endeavouring to meet the wishes of the Committee) to hazard an opinion on an undertaking of such magnitude—still less to incur the responsibility that attaches to a "professional opinion."

I must therefore confine myself to answering the Queries put to me in the best manner I am able, fortifying those answers by any proofs that may lay in my power; and first of List **No. 1.**

1. From the causes already assigned, the Committee are aware that I must be cautious in committing myself so far as to give an opinion assenting to, or dissenting from, the line proposed by Lieutenant Schalch, from my total ignorance of its locality; but no doubt he has selected, what he considered the best, after having surveyed so much in that quarter.

(3) Paper E. para. 26.

(3)It is unfortunate that it will be intersected by so many other streams, as they will occasion a quicker expenditure of its waters, cause whirlpools, and boats may be in danger in crossing broad Rivers; yet from what I can observe in the Map, these inconveniences bear no proportion to the fact of the Baugrutty, Jellinghee, and Mattabangah Rivers, being impassable for large boats nearly one-half of the year.

* NOTE.—The Municipal Committee do not think it necessary to print the Barometrical Observations here referred to.—J. M.

A great deal will however depend upon the soil, and to ascertain the quality of this, numerous borings should be made before hand, and not more than half a mile asunder, if so much, for it is impossible to make a permanent Canal amid shifting sands.

2. I am of opinion that being within tide water will be beneficial to the Canal. It will be better fed thereby; those who use it will have the advantage of flood and ebb, and not be always obliged to track; and, if the soil is good, there will be less deposit than would take place in higher parts of the Delta, beyond the reach of tides.

3. The Canal should have at the least 60 feet Base, its banks forming an angle of 34° therewith—so that with 7 feet in it at Low water (as proposed by Lieutenant Schalch) the surface will be 81 feet; at 10 feet depth 90; and at 17, as proposed at page 5 of the Memoir, 111 feet; and at 20 feet deep 120 surface, and so in proportion for greater or lesser depth.

These are the dimensions of the Eastern end of Tolly's Nullah, which is there 10 feet deep, when enlarged and deepened in 1806—widening gradually as it approaches Calcutta to 110, 115, 120, 128, 140, 150, 170, 180, 190, and 200 feet; most of the latter dimensions, however, arise from the crumbling down of the Bank (and consequent shallowness of the Bed) owing to the sandiness of the soil.—The towing path, if on a level with the country, or nearly so, should not be less than 20 feet; but if by track-ways in this Query, are meant Dykes to bund in the water of the Canal, in low situations, it must be proportionably broader, according to the weight of water it will have to sustain.

4. There is no confiding in one set of Borings, more especially, when we are uninformed *where* they were made. The late General Garstin told me that in Fort William a sand of the loosest sort, lays at 10 feet below the surface; and at 50 feet from it good firm clay was found. I enclose some Tables of Borings taken by myself chiefly in the vicinity of the Esplanade, some on the South, and others in the North of Tolly's Nullah.—These shew the ridges in which the sand lays; and which is not to be wondered at when we reflect that the lower parts of Bengal are formed from the washing down of the Upper Provinces; should similar strata be found in the direction of the proposed Canal, they would materially affect the success of the scheme.—The remedy proposed by Lieutenant Schalch is very proper; but in addition to the backing of clay, the sand must be picked out that lays in the triangle between the superstratum and the blue clay, and replaced by the latter. If water is let into the Canal before this is done, or a heavy fall of Rain should wash out the sand, the stratum above it would sink down and considerable injury possibly be done.

In none of the borings I have made, does a firm soil reach to a depth of 20 feet; what it may be higher up the country or over to the Eastward, it is out of my power to say; I can only (as I have already done) recommend previous boring.

5. (1)In my opinion it will be found an ineligible plan to bring the line of Canal through the Salt Water Lake. It is true the River water enters at Chitpore Bridge and passes through the Chitpore Nullah into the Marattah Ditch, and thence through the various outlets to the Lake without inconveniencing the Eastern parts of Calcutta; but this is widely different from a large Canal of 90 feet in spread with the Bore rushing up it, and from the difference of Level causing a most rapid current. The Dykes to confine it must be proportionably strong; the digging through the Lake would be very expensive; and to let off the Calcutta water there must be some sluices made here and there, similar to that at the Bankshall; and without Flood Gates I am convinced it would not answer; Gates not only at each end, but at an intermediate spot, so as to enclose a back-water

(1) Paper E. para. 1[illegible]

to scour out the Canal, when obstructed by sediment and other causes; all this is very expensive—and should the misfortune happen of the Dykes breaking in any part, what is to become of the country to the N. E. of the Town and of the Dum-Dum cantonment! If the Canal is made to embrace the Eastern side of the Salt-water Lake, this danger would be avoided. It might enter from the River near to Barnagore, pass on to Gourypore, and thence clearing Dum-Dum and the Practising ground stretch over to Bamunghatta—unless a direct line to Narrainpore (or G. in Lieutenant Schalch's Map) should be preferred—but this latter would occasion a little more digging; this however would be compensated for by the paucity of Bridges compared with the line proposed by Lieutenant Schalch. By these means the Lake would still exist to supply us with fish; to drain the Suburbs; and leave Government free to extend the limits of the settlements as far East as may in process of time be found requisite.

6. This is I think answered in the preceding article, but with flood-gates no more water need be let in than is requisite for the Navigation of the Canal; this will prevent the submersion of the Eastern parts of the City—but on the other hand, it is to be considered that such a bed of sand would deposit on the apron of the sluice in the rains (and it is only then they require to be shut,) that a continued expense would be incurred to clear it away every tide before they could be opened.

(1) Paper E. para. 17

7. The[1] method of bunding out, proposed by Lieutenant Schalch, is undoubtedly the best where water is to be confined *in* or kept *out* for a length of time, such as 3 or 4 months. It is the simplest, and the cheapest, for if one of the Beams decay, it is replaced without loss of time and at trifling cost—but they must be either before, or in the rear of a Bridge, for the Beams could not be dropped into the grooves *under an arch* as described in the section; further, the bund should not exceed 16 feet, and it is obvious that Boats could not pass through such an arch; or even if, by means of extremely stout Beams, the Bund extended 20 feet, the arch would still be a great hindrance to navigation—even if the Bridge has two. The tide would occasion great falls under them; and a great quantity of sand and silt will accumulate against the Bund, on the side next the River, to a height scarcely credible to those inexperienced in these matters. But this would be avoided by flood-gates, and the whole of the Canal left navigable by merely closing them when the water in the Canal sufficed for navigation without inundating the lower part of the Town. This however need not be further discanted on, as I have detailed at No 5 the objections to a Canal passing *through* the Lake.

(2) Paper E. para. 21.

8. From the pains evidently taken by Lieutenant Schalch in his levels, it is natural to presume they are correct. Still it would appear that some little error[2] has crept into what relates to the difference of level between the surface of the Lake in the rains and in the dry season,—the greatest difference set down is only 15 inches. That the tides from the Sea cannot force their way through the sinuosities of the Sunderbunds with that rapidity they do through a wide and open River like the Hooghly, is self-evident; still a considerable portion must get into the Lake, and this aided by the drainage of the country to the East partially so from Calcutta, and some River water through the sluice at Cauntapooker impressed me with the idea that the difference must be more. But before I would venture on an unconfirmed opinion on the subject, I determined to make some inquiries, and those I have made at Saumnagore, at Syaldah Bridge, and at Balliaghat, convince me that the difference is at least 2 feet to 2-6 according to the state of the Tides.

9. On the proposed site of the Canal the Basin is well selected—the same will be the

case if the Canal opens from the vicinity of Barnagore, for I am well informed that many boats take refuse in Bally Khaul, on the opposite side of the River to Barnagore, during bad weather;—of course they would prefer a Harbour in their direct route.—

## I NOW PROCEED TO REPLY TO THE QUERIES CONTAINED IN LIST[1] No. 2. (1)Paper E. para. 6. & 18.

Calcutta stands upon the Bank of a Noble River, and it becomes of consequence to open the drains at once into it, rather than let the water dribble three miles to the Salt Water Lake, and thence through the Sunderbunds to the Sea. The main Drain, South of the Loll Dhiggee, is very deep—yet who has seen that quarter of the City inundated at the highest Tides?

An extremely heavy shower of Rain, of long continuance, might lay a street under water owing to more water falling than the drains could deliver during that period; but this would equally happen in any Town, however high it stood. If no injury occur from the Drain at the Bankshall, why should it in the Northern parts of Calcutta, which are higher? The surface of the River water will be the same before each station,—only where the Land is higher, the drain must be proportionably deeper.

[2]I would therefore propose that a large Tunnel (similar to that at the Bankshall) (2) Paper E. Para. 17 and 18. be made across the City at every 2000 feet, or as near to that, more or less, as the situation of the streets would permit. The chamber of this Tunnel to ascend gradually from the River, until it is only three feet below the surface of the ground; this aperture being with the arch as little as could be allowed for the people to descend to clean it; thence the slope should turn the other way, and that portion of the City (which I believe would be not very large) drained towards the Mahratta Ditch; so that should a heavy fall of Rain happen at the very top of high water, still there would be a vent to the East, for what the River did not receive, and a free course, when desired, would be left to the Tide to wash out the Tunnels and Collateral Drains.

2. When I made the Tunnel (in 1807) to fill the Loll Dhiggee from the River, I added a valve a short distance to the East of the Tunnel, to prevent the escape of any of the water, and to throw the whole into the Loll Dhiggee. This valve of course precludes any water passing into the Lall Bazar and Boitaconnah Street Drains, although it admits drainage from them. But if this valve is raised, the water will pass freely through the City to the Mahratta Ditch, and without the slightest damage to any Drain or House whatever. The rate would not exceed half a mile per hour.

3. A certainty of choking it considerably—independent of the abominable stench it would occasion. This is proved by the fact of the Balliaghaut Canal (dug only in 1809,) having required cleaning, at the Calcutta end, twice in this period,—yet into this Canal comparatively clean water only passes.

4. The water would not have energy sufficient to scour out the Tunnel and Drains, unless it were kept pent up till nearly high water; opening a sluice then—the sudden rush of water would carry every thing before it, until length of passage and friction against the sides modified its velocity:—still sufficient impulse would remain, I imagine, to convey the filth into the Canal, where it would deposit.

5. This will depend upon the size of the Tunnel or Drain, and the distance the materials have to be transported. But they should be formed of the best masonry, and expence is but a secondary consideration where Life and Limb are concerned, and when

it is considered that the first cost is the only one:—they will require no repair, or constant scarping and trimming on the sides, like a Cutcha Drain. Among other advantages, may be enumerated the following (and which I believe I submitted to the Committee of Improvement some years ago), viz. they put an effectual bar to encroachments.—2nd. The water has a regular and easy passage through them—as they go on widening as they lengthen; whereas, before they were introduced, one single entrance Bridge narrower than the rest, inundated a whole street.—3rd. They cannot be obstructed by cocoanuts or baskets floating against an entrance bridge, as formerly.—4th. Neither can people make bunds across them to catch Fish.—5th. Nor can they be converted into necessaries.—6th. The filth from the Road is caught in the upper Drain, whereas in an open drain it must fall at once to the bottom, and require more frequent cleaning.—7th. They prevent accidents to Carriages and Horses, by falling into the drain—nor can a Carriage be overset by accidentally driving into one of them, as the hollow of it never exceeds 5 or 6 inches.—8th. They emit much less smell than open Drains.—9th. In an open Drain the water dribbles gently down the side in proportion as the shower falls, and does not disturb the bottom. In these covered Drains, the only entrance being at the gratings, the rain rushes down these with velocity ploughs up any filth at the bottom, and carries off a considerable portion of it.—10th. They give a finished appearance to a street, and virtually widen it.

6. Assuredly not—the Canal would be choaked up with insufferably offensive fecula.

7. Balliaghaut Canal has been in use 12 years, totally unfettered by Locks or Sluices—and no part of Calcutta has been inundated thereby in the heaviest Rains.

8. The obstacles and risks appear to me very serious, and I have endeavoured to express them in my reply to No. 5 of the first series of Questions.

(1) Paper E. para. 20.

9. These lands are [1]Rice fields—and must be kept under water; should there not fall a sufficiency of Rain for this purpose, and the Ryots be debarred any auxiliary aid from the River, the plants would be parched up, and the lands be unproductive.

(2) Paper E para. 50.

10. Tank digging is thus computed—a [2]Cube of 6 Cubits, or 9 feet each side, is called a Chowker or Dhaur. This Dhaur contains 729 Cubic feet, and will cost from the surface to a depth of 9 feet, One Rupee per Dhaur. The next 9 feet in depth will cost Rs. ans. 1-8. The third Rs. ans. 2-4, and the fourth. Rs. ans. 3-6. But the cost of digging through the Salt Water Lake would probably average double the foregoing, owing to the quantity of Baling, Bund-making, and removing and clearing out the Mud—which must be by Pans and Buckets, as it would not lay upon a Codallie.

11. The Harbour would be at all times useful (vide answer to No. 9 of the first series), especially from March to September, during which the Bores prevail every springs.

12. A Table of Borings is herewith sent.—In reiterating my former apologies for this unavoidable delay, I have to add others for the many inaccuracies that will be found in my answers, owing to the continued interruptions I have experienced, and as, from the situation I fill, my door must be open to the poorest householder, it was impossible to seclude myself, and it has been only by snatches that I could devote any time to a subject that requires deliberation and patient thinking. Further, apologies are also due for many clerical errors from the ignorance of a Native Copyist, and I am unwilling to cause further delay by having it recopied.

I have the honor &c.

*(Signed)* RICHD. BLECHYNDEN.

CALCUTTA,
*January 26th*, 1822.

# E 14. *a.*

## *Borings at Kidderpore—North of Nullah, October 20th*, 1810.

| Feet. | Inches. | |
|---|---|---|
| 6 | 0 | Common Earth, of a yellowish cast. |
| 4 | 0 | Ditto, ditto, with a mixture of Reddish Sand. |
| 1 | 6 | Yellow Clay. |
| 2 | 9 | Ditto, ditto, mixed with Red Sand. |
| 4 | 6 | Blue Clay. |
| 2 | 3 | Grey Sand. |
| 1 | 0 | Ditto and Wet. |
| 3 | 6 | Quicksand. |
| 0 | 6 | Sand with more cohesion of particles. |
| 0 | 8 | Ditto, still more tenacious. |
| 1 | 4 | Ditto, with a slight mixture of yellow Clay. |
| 1 | 0 | Sand with soil much firmer. |
| 1 | 0 | Whitish sand—very wet. |
| 0 | 6 | Soft Mud. |
| 0 | 6 | Ditto, but more inclined to clay. |
| 0 | 8 | Ditto, but sandy, and the grain a small degree coarser. |
| 0 | 8 | Grey sand, inclinable to white as it dries. |
| 4 | 8 | Ditto ditto ditto ditto. |
| 4 | 3 | Ditto ditto ditto ditto. |
| 1 | 0 | Quicksand. |
| 5 | 3 | Ditto and the grain coarser. |
| 8 | 6 | Sand of a blackish cast. |
| 4 | 0 | Ditto with a slight mixture of blue clay. |
| 60 | 0 | |

## *Borings at Kidderpore, October 29th*, 1810.

| | | |
|---|---|---|
| 4 | 0 | Dry Reddish Garden mould. |
| 1 | 0 | Ditto soil, but inclines to moist. |
| 1 | 0 | Ditto ditto a small degree moister. |
| 1 | 0 | Ditto exactly like clay. |
| 1 | 0 | Ditto reddish clay. |
| 1 | 0 | Ditto ditto. |
| 1 | 0 | Ditto soil feels warm. |
| 1 | 0 | Ditto moister and a little red sand in it. |
| 1 | 0 | Yellow clay. |
| 1 | 0 | Ditto tending to a blue cast. |
| 13 | 0 | |

| | Feet. | Inches. | |
|---|---|---|---|
| Brought over, | 13 | 0 | |
| | 1 | 0 | Blue clay. |
| | 1 | 0 | Ditto. |
| | 1 | 0 | Ditto ending in greyish sand. |
| | 1 | 0 | Yellow clay. |
| | 1 | 0 | Ditto mixed with blue. |
| | 1 | 0 | Blue clay and fine sand. |
| | 1 | 0 | Ditto ditto. |
| | 1 | 0 | Blue clay. |
| | 1 | 0 | Ditto ditto inclining to grey. |
| | 1 | 0 | Ditto and fine grey sand. |
| | 1 | 0 | Ditto more sandy. |
| | 1 | 0 | Mostly red sand. |
| | 1 | 0 | Red and grey sand mixed. |
| | 1 | 0 | Grey sand. |
| | 1 | 0 | Ditto. |
| | 1 | 0 | Ditto with a slight tint of yellow. |
| | 1 | 0 | Ditto ditto but the yellow in flakes. |
| | 1 | 0 | Ditto ditto more cohesive. |
| | 1 | 0 | Ditto ditto less so, and sandy. |
| | 1 | 0 | Grey sand with fine particles. |
| | 1 | 0 | Ditto ditto. |
| | 1 | 0 | Ditto inclinable to white as it dries. |
| | 1 | 0 | Grey sand which dries whiter. |
| | 1 | 0 | Ditto with very fine particles. |
| | 1 | 0 | Ditto ditto. |
| | 1 | 0 | Ditto ditto, particles more shining. |
| | 1 | 0 | Ditto ditto ditto. |
| | 1 | 0 | Ditto, this more earthy than the others. |
| | 1 | 0 | Loose sharp grey sand inclinable to white. |
| | 1 | 0 | Ditto, but particles finer and more slutchy, but dries hard. |
| | 1 | 0 | Grey sand not quite so firm. |
| | 1 | 0 | Ditto ditto. |
| | 1 | 0 | Ditto ditto. |
| | 1 | 0 | Ditto of a loose texture. |
| | 1 | 0 | Ditto ditto. |
| | 1 | 0 | Ditto sand smaller grain. |
| | 1 | 0 | Ditto still finer. |
| | 1 | 0 | Ditto with fragments of shells. |
| | 1 | 0 | Ditto ditto. |
| | 1 | 0 | Ditto ditto, very fine grain. |
| | 1 | 0 | Ditto ditto, almost white. |
| | 1 | 0 | Ditto ditto. |
| | 1 | 0 | Ditto ditto. |
| | 56 | 0 | |

## *Borings at Kidderpore, November 5th,* 1810.

| Feet. | Inches. | |
|---|---|---|
| 7 | 0 | Garden Mould of a yellow cast. |
| 3 | 0 | Yellow Clay. |
| 1 | 0 | Ditto, mixed with red Sand. |
| 1 | 0 | Red Sand. |
| 2 | 0 | Ditto, ditto, with small shining particles. |
| 3 | 0 | Ditto, with earthy particles. |
| 2 | 0 | Bluish Sand. |
| 1 | 0 | Ditto, inclining to grey. |
| 1 | 0 | Ditto, of a very fine grain. |
| 1 | 0 | Ditto, with more cohesion. |
| 1 | 0 | Grey Sand. |
| 2 | 0 | Worse, and drying whiter, and leaving the fingers clean when rubbed dry. |
| 1 | 0 | Ditto, but soiling the fingers, having some mud in it. |
| 1 | 0 | Grey Sand with a slight mixture of Red Sand in it. |
| 1 | 0 | Reddish Sand. |
| 3 | 0 | Ditto, with a mixture of grey in it. |
| 1 | 0 | Grey Sand with strata of Red. |
| 2 | 0 | Ditto, ditto, but of a larger and sharper grain. |
| 1 | 0 | Grey Sand with a sharp grain, but somewhat more tenacious than the last. |
| 1 | 0 | Ditto, ditto, with small particles of shells in it. |
| 1 | 0 | Ditto, ditto. |
| 1 | 0 | Grey Sand inclining to Red. |
| 1 | 0 | Ditto, ditto, but with a portion of Red Sand in it. |
| 1 | 0 | Nearly an equal mixture of Grey Sand and Red. |
| 1 | 0 | More Red than Grey, but laying in strata. |
| 1 | 0 | Entirely red Sand with a little Loam in it—and now it is dry it bears gentle handling without breaking. |
| 1 | 0 | Yellowish Sand. |
| 1 | 0 | Ditto, ditto, with small shining particles. |
| 1 | 0 | Ditto, with much Grey Sand intermixed. |
| 1 | 0 | Ditto, with a larger portion of Grey Sand. |
| 1 | 0 | Red Sand. |
| 1 | 0 | Ditto, with a mixture of loose White Sand. |
| 1 | 0 | Red Sand of a very fine grain. |
| 1 | 0 | Ditto, again mixed with loose White Sand. |
| 1 | 0 | Loose Grey Sand tinged with red and small shining particles. |
| 1 | 0 | Ditto, ditto, with red laying strata. |
| 1 | 0 | Reddish Sand, with a slight degree of marl. |
| 1 | 0 | Ditto, ditto, with much loam in it, dries hard. |
| 1 | 0 | Ditto, ditto. |
| 55 | 0 | The key of the 4th rod broke here, so could go no deeper. |

## *Borings at Kidderpore, November 10th,* 1810.

| Feet. | Inches. | |
|---|---|---|
| 6 | 0 | Common Earth of a reddish colour. |
| 4 | 0 | Red Clay. |
| 1 | 0 | Ditto, with Red Sand amongst it. |
| 1 | 0 | Yellow Clay. |
| 1 | 0 | Ditto, with a blueish cast at the bottom. |
| 2 | 0 | Blue Clay. |
| 1 | 0 | Ditto, ending in Greyish sand. |
| 1 | 0 | Ditto, Yellow Clay. |
| 1 | 0 | Ditto, mixed with Blue |
| 3 | 0 | Ditto, blue Clay with fine Sand. |
| 1 | 0 | Ditto, Sand inclining to Grey. |
| 2 | 0 | Ditto, with a larger portion of Sand. |
| 1 | 0 | Mostly Red Sand. |
| 1 | 0 | Red and Grey sand mixed. |
| 2 | 0 | Grey Sand. |
| 1 | 0 | Grey, but with a slight mixture of Yellow. |
| 2 | 0 | Ditto, and the Yellow laying in strata. |
| 3 | 0 | Grey, the particles very fine. |
| 4 | 0 | Ditto, ditto, and inclinable to white as it dries. |
| 2 | 0 | Ditto, with very fine and shining particles. |
| 1 | 0 | Ditto, with a little Earth intermixed. |
| 1 | 9 | Loose sharp grey Sand inclinable to white. |
| 1 | 0 | Mud and Slutch. |
| 5 | 0 | Grey Sand of a loose texture. |
| 2 | 0 | Quicksand. |
| 3 | 0 | Grey Sand with particles of Shells. |
| 3 | 0 | Sand very fine, and almost white when dry. |
| 56 | 0 | Feet. |

The Dates indicate the day on which each boring commenced, and each Well required several Days.

The Committee will observe that in all these borings no mention is made of Trees, &c. as is usually found ; the fact is, I met with no vegetable matter whatever, and on remarking this to Mr. H. T. Colebrooke, and my suspicion that this had once been a River—he told me that the Natives have a tradition to that effect. I have many other Tables of Borings at different places, but so injured by white ants and moisture, that nothing can be made out from the scraps at all useful to the Committee. I shall just add, that on clearing away the ruins of the Kidderpore Bridge that fell on the 4th of July, 1806, I found the strata to be as follows—

| | |
|---|---|
| 10 | Garden Earth. |
| 4 | Sand and Clay. |
| 5 | Red Clay. |
| 10 | Sand ; and I suppose the bed is still deeper, but we had no occasion to dig lower. |

(*Signed* R. B.

# [1]E 15.

(1) Paper E. para. 6.

MAJOR R. C. FAITHFULL,

*Secretary to the Special Committee for Reporting on Lieut. Schalch's Plan.*

SIR,

I have to acknowledge the receipt of your letter of the 28th November last, transmitting copy of Lieut. Schalch's Memoir, together with a Sketch of the Tract of Country through which the line of Canals is to run, and two lists of Queries for replies; and agreeably to the request of the Committee, have herewith the honor to submit my replies thereto written opposite to the Queries.

I beg likewise to submit a Sketch of the country between Calcutta, Dum-Dum, and Barrackpoor, shewing a proposed line of Ditch Canals which I conceive might be carried at a trifling expense, taking advantage of a small Creek shewn on the Sketch, and which would, I am of opinion, be of great benefit for an increased facility of communication between Calcutta and the Lake, and these two Military Stations.

I am, &c. &c. &c.

CALCUTTA, *(Signed)* J. KYD.

*23rd of January,* 1822.

# E 15. *a.*

## [2]List **No. 1.**

(2) Paper E. para. 11

1. I entirely approve of Lieutenant Schalch's plan of Canals, and of the improved line proposed by him, as sketched on the Map. I have no local knowledge of the tract of country through which the Canal is to be carried, but am quite[3] satisfied, from the information given by Lieutenant Schalch in his Memoir, that it is practicable, of easy execution, and well adapted for the great object it has in view.—I do not apprehend any difficulty or inconvenience from the Line intersecting the numerous streams which cross its course; the instances given of Goodlad's Creek, and Morrieson's Cut, are in point: besides many of the Sunderbund communications are actually in a direction across the principal streams—the Altarah Bhanka for instance.

(3) Paper E. para. 26

2. The whole of the Sunderbunds being in fact natural Canals, levels within the influence of the Tides, new Cuts, particularly in the Upper parts, are not likely to suffer injury in their Banks more than the present ones are; and not so much so as in Rivers, not affected by Tides, which suffer from annual floods. The most of the Sunderbund higher passages, are branches or arms of the Sea, with very moderate Tides, and little deposit of mud, and scarcely any sand.

3. The larger the better; not less than one hundred and fifty feet broad at the top, 80 feet at bottom, and 7 feet in depth at low water; Trackways 60 feet.

4. Certainly not.—Appear likely to be attended with the success desired. Agree entirely with Lieutenant Schalch's statement.

the freedom from sand banks, and on all these points I am happy to be able to confirm all that Capt. Schalch has stated.

4. I likewise believe that the strata of earth to be expected, is accurately stated; and I have not the least doubt that all the Levels may be depended upon.

(1) Paper E. para. 11.

5. I am of opinion, that Capt. Schalch's proposition is very[1] practicable, and likely to be attended with the most beneficial consequences to the Trade of Calcutta.

I have, &c.

SUPT. BGS. OFFICE, (*Signed*) P. PHIPPS,
BARRACKPORE, *Supt. Bgs.*
24*th December*, 1821.

(2) Paper E. para. 6.

# E 17.

To R. C. FAITHFULL,
*Secretary to the Committee of Lieut. Schalch's Plans, at Chowringhee, Calcutta.*

SIR,

I have the honor to acknowledge the receipt of your letter of 20th instant, together with its enclosures, Memoirs, Maps, and List of the Queries, which I have transmitted to the Committee of Embanks at Jessore, under whose control I am placed, but from an ill state of health, I am retiring from the duties of Superintendent; the Committee will furnish my successor with the documents above stated, that he may prepare answers to the Queries, and his sentiments on the important object before your Committee.

I have, &c.

DAMOODIAH, (*Signed*) JAS. FRASER,
28*th December*, 1821. *Supt. of Poolls.*

(3) Paper E. para. 6.

# [3]E 18.

TO THE SECRETARY TO THE SPECIAL COMMITTEE, LIEUTENANT SCHALCH'S PLAN, CALCUTTA.

Fouzdary Adawlut.

SIR,

I am under the necessity of returning the List of Queries which accompanied your letter of the 1st. December last, from inability to afford the information thereby required.

2. Owing to a mistake on the part of my Omlah, your letter has been unattended to for a longer period than it otherwise should have been, for which I have now to apologize.

3. The navigation proposed is confined to a very small proportion of this district, and without a personal survey, it is impossible for me, or any one, to answer your Queries.

With reference to Query 6, I would furnish as many men as would be required for labour in that part of this District, where a Cut would be made.

The route proposed by Lieut. Schalch, would be attended with every advantage, and would become an object of preference to the natives from its being less dangerous, from its being nearer, and consequently attended with less expense on account of boat hire.

I am, &c.

ZILLAH JESSORE, *(Signed)* J. HARRINGTON,
*11th March*, 1822. *Magistrate.*

## [1]E 19.

(1) Paper E. para. 6.

To CAPT. R. C. FAITHFULL,
*Secretary Special Committee Lieutenant Schalch's Plans, Calcutta.*

SIR,

I was duly favored with your Letter of the 21st ultimo, enclosing Lieut. Schalch's Memoir, with a Map and a List of Queries; the latter of which I have now the honor to return, filled up to the best of my knowledge.

The proposed line of Canals appears to me to be peculiarly well laid down, and if carried into execution, will afford a beautiful safe Navigation throughout the year, free from every danger.

Such a route is much required, particularly by the Western boats; to them the present Sunderbund passage is full of danger and inconvenience; with a head wind they can make but little way; and are frequently driven to the sides of the banks, when a good deal of time is consumed in getting out. The dandees of these, generally cook on shore, and mess separately; the present route not affording them the means of cooking on shore, must be disliked, and the length of time taken up in performing the trip, must operate in raising the price of freight. Lieut. Schalch's route will remove all objections to the Sunderbund navigation, the distance will be very much curtailed, and the comforts of the boat people amply provided for. If the banks are kept clear of jungle, the dandees will have the option of working all day and laying to at night; this will be a great inducement to the large pattelahs. &c. The cut from Deacool to Sereepore if abandoned, will leave the work in my humble opinion but half finished. The Canal at the back of the Circular Road will be of great service to the Native Merchant boats, and relieve the different ghauts in the River.

I am sorry I cannot give my opinion regarding effects likely to take place in the level of the Salt Water Lake, by letting in the river, as I am wholly incompetent on the subject.

I have the honor, &c.

DACCA, *(Signed)* THOS. WOODEN.
*8th January*, 1822.

# E 19. *a.*

(1) Paper E. para. 26.

## [1]List No. 3.

I conceive there will be little or no difficulty in cutting the proposed Canals, and that the scheme is fully practicable.

2. The Rivers and Nullahs, in the route of the Sunderbund passage, are scarcely at all affected by depositions of mud and sand. Goodlad's Creek and Morrieson's Cut, instead of filling up, have considerably enlarged their dimensions both in breadth and depth.

3. In my humble opinion, the ebb and flood of the tides preserve the banks; as they are not acted upon in the same way, but in a manner relieved by the regular changes of the current—In a stream constantly running down, particular parts of the banks must be corroded away.

(2) Paper E. para. 27.

4. [2]The execution of the proposed line of Canals will tend very materially to bring that part of the country into the highest state of cultivation, and eventually lead to further improvements in the Sunderbunds.

5. Unable to answer this.

6. From the great number of men annually required by the Indigo works in Jessore, I am induced to believe a sufficient number may be procured, without going out of the district; I cannot however positively speak to this point; Myhutty Pergunnah will give a number of hands.

(3) Paper E. para. 50.

7. [3]I am given to understand the rate of Tank Digging in Jessore is for a piece of ground 45 cubits long, 5 do. broad, and one cubit deep, one Rupee.

8. Unable to reply.

(4) Paper E. para. 19.
(5) Paper E. para. 23.

9. [4]To the best of my knowledge few losses are sustained by the Eastern boats from Koolna to Tardah; those that occur are most confined to the wood boats. Though actual losses are rare, the injury which boats of every description meet in forcing their way through the jambed up[5] Tolly's Nullah is so great, that another Route more open is loudly called for. Lieutenant Schalch's Route would, I conceive, remove every objection to the Sunderbund Navigation.

(6) Paper E. para. 23.

10. [6]Chandcolly is rather dangerous; so is Roymongul. More I am not able to state.

10½. I cannot speak to this point with any certainty; I believe losses by robbery are getting scarce.

(7) Paper E. para. 27.

11. [7]From Baliaghaut to Koolna during the months of

| | | | |
|---|---|---|---|
| November, December, January, and February, | 5 days, vice versa | | 5 |
| March, April, and May, .. .. .. | 6 to 7 | .. | 10 |
| June, July, August, .. .. .. | 5 to 6 | .. | 8 to 10 |
| September, and October. .. .. .. | 5 | .. | 5 to 6 |

the above time generally taken by a heavy laden pulwar of 800 maunds.

12. I believe at Purroreah and Roymongul, about the times of the Equinoxes, at the latter about four days, according to the state of the weather.

13. Certainly it would be very desirable, and every boat would take advantage of the proposed Route.

14. Most assuredly Lieut. Schalch's Route would afford so many advantages to the Western boats, that I am firmly persuaded they would undertake it with alacrity, whereas at present far from taking the Sunderbund Navigation with cheerfulness, nothing but sheer necessity makes them move through a passage where they are much perplexed, and put to greater inconvenience in cooking, &c. &c. Instead of pulling through a dreary waste in dark nights, they would have the option of tracking all day and laying to at night; I conceive this circumstance alone would go very far to conciliate them to the proposed Route.

15. (1)Morrieson's Cut was originally about 30 feet broad, is now near 150 feet—depth, at high water was about 5 cubits, is now 15 cubits or more. Goodlad's creek was only passable at high water, is now navigable at all times. I cannot precisely state the time employed in excavating Morrieson's Cut, but understand from 3 to 3½ months. (1) Paper E. para. 12.

16. Morrieson's Cut when first opened was very small; in the course of two years it attained almost its present size, and has since continued without any visible change, and appears to be fixed.

To the best of my knowledge, nothing has been done to the Nullahs. since they were first cut.

18 to 21. } Unable to reply to these queries.

22. From Baliaghaut to the Ganges, at the head of the Pansah Maddoham [Moddapour] River, during the months of

| | | | | |
|---|---|---|---|---|
| November, December, January, and February, | 12 | days, vice versa, | 9 days |
| March, April, and May, .. .. .. | 12 | ditto .. | 19 ditto, |
| June, July, and August, .. .. .. | 10½ | ditto .. | 16 ditto, |
| September, and October, . .. .. .. | 11 | ditto .. | 12 ditto, |

The above time generally taken up by a heavy laden pulwar of 800 Mds.

23. The Eastern boats give a decided preference to the Sunderbund Route, and the Mangees and Dandees of such, both Mussulmen and Hindoos, generally cook on board, and consequently are not put to any inconvenience, their boats are moreover better adapted for the navigation, and having always gone through it, they have no fears which can operate in raising the price of freight.

On the contrary, the Western boats being ill adapted for the Sunderbund passage, they are not able to make all the tides, and fall behind; the delay thus occasioned, and their not cooking on board, are serious detriments to their pursuing this route, and no doubt operate in raising the price of freight.

24. Not able to state precisely the difference.

25. The Insurance ought to be reduced, as there would be no danger—Freight ought also to undergo a reduction in proportion to the benefit derived; of the extent per cent, I am unable to state.

26. Four or five days the utmost at the Roymungul, half a day, to a day at the others.

27. Yes; the proposed route will be so well adapted for the Western Boats, that they will without hesitation avail themselves of it,—particularly if the Jungle is cleared away from the banks, and opportunities afforded them of tracking.

28. The present anchorage in the River is so full of danger to boats from the Bore, storms, and the shipping, that I am led to conclude the proposed basin would be eagerly caught by the Native laden boats in the North-west Monsoon.

Dacca, *6th January*, 1822. *(Signed)* THOS. WOODEN.

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(1) Paper E. para. 6.

# (1) E 20.

To CAPT. R. C. FAITHFULL,

*Secretary to the Special Committee, Lieut. Schalch's Plan.*

SIR, *Calcutta, 28th January, 1822.*

I have the honor to acknowledge the receipt of your Letters No. 39 and 119, with their enclosures, relative to my opinion as Secretary of the River Insurance Company, respecting Lieut. Schalch's Plan for a more direct passage from Calcutta to Koolna, so as to avoid the Circuitous route of the Sunderbunds, and submitting certain Queries for me to answer, which I should have replied to much earlier, had it not required considerable time to collect the different matters that your questions lead to, added to that of my time being so fully occupied by my other avocations in business.

In the first place, I beg to state, that I have read and examined with particular attention, Lieut. Schalch's Plan, with the Map you furnished me with, and certainly consider it likely to be of very great benefit to the Eastern Trade of this Metropolis, by facilitating the communication from the Eastward particularly, and also lessening the anxiety of risk, for I cannot say the risk is great by the Sunderbunds, as you will observe by the following answers to your questions, at least so far as relates to our Office, although I should at the same time notice, that I have heard of many casualties not connected with this Office.

I should premise, that some seasons are much more favorable than others in respect to the Bhagruttee remaining open; for in some instances it has remained open nine months in the year; in 1820, it opened about the end of May, and out of an Import of 2200 Bales of Cotton from one House in that year, 2000 bales came by the Sunderbunds. In 1821 large Boats were able to pass the whole year through the Bhugruttee; but I have understood this to have been occasioned by a passage having been cut to admit the Governor General's Boats to come down in the month of January, after his excursion to Rajmahl, &c. consequently whenever this passage is open, the new Cut will never be resorted to for the *Western Trade*, which will of course reduce the Tolls of the new Cut considerably.

In this year, from an Import by the same House as above mentioned, of 4300 Bales of Cotton, only 1500 went by the Sunderbunds, and not one boat was detained at Bogwangolah, and not a Boat was lost in either passage.

From the inquiries I have made amongst the Ghaut Mangees and Mangees of Boats, they seem decidedly to say that the new Cut would be invariably resorted to (provided the Toll duty did not bear too hard upon them) in preference to the Sunderbund Passage, when the Bhagrutty, Matabungah, and Jelinghee were closed.—In respect to the proposed Canal or Harbour for *sheltering* boats during stormy weather, or the Bores, and on the springs in the Freshes, I am decidedly of opinion it would be attended with great advantages,—being a place much required.

In replying to your questions, I shall take them in the order they stand in the Lists, and meet your wishes as nearly as I can, although I fear I shall not be able to give you so full an explanation on the whole as you may expect, but hope you will take the "will for the deed."

I have the honor, &c.

(*Signed*) H. MATHEW,

*Secretary R. Ins. Company.*

# E 20. *a.*

## List **No. 3.**

The Questions No. 18, 19, 20, and 21, I must reply to under one Paragraph, for the annual number of Boats dispatched *to* and *from* the Upper Provinces from this Office, have of course considerably varied, as in the infancy of this Institution, the number were small the first two years, but they have more than doubled the last three years, however the Season of 1821-22 has been stationary with the preceding three years, owing, I should suppose, to speculations being so much curtailed.

From 1st May 1816, to 30th April 1821, a period of 5 years, we insured by the Matabangah and Sunderbund passages (I am obliged to include both these routes, as I have no means of dividing them now) 684 Boats of all descriptions; estimated to carry 4,49,900 Maunds; none of which were lost in the Mattabangah, and only two in the Sunderbunds from Calcutta, carrying 1200 Maunds of Goods, and 6 from Sylhet with about, 5,000 Maunds of Chunam, although our losses were very heavy above in the Ganges, and in Boats coming from Sylhet.

22. [1]This so much depends upon the conduct of the Mangees of the Boats, that it is impossible to reply to it correctly, for I have known some Boats take near a month, whilst others have not been more than a week, and they *ought* not to be more than a week, except they meet with violent gales of wind, when they must of course lie by, but this rarely occurs.

(1) Paper E para. :

23. We pay the Mangees and Dandees no greater pay or rate of freight in this passage, except for the extra time for the same being prolonged, which is invariably calculated at 7 days, and we have no difficulty with them in proceeding this passage.

24. No additional Premium is required by this Passage, and Boat hire only as above mentioned, besides the Toll duty at Tolly's Nullah, which also exists at the Mattabangah; we have never had any boats come by the Jellinghee passage.

25. I do not conceive we should be able to persuade the Boatmen to reduce their rate of freight beyond the 7 days extra pay, and the rates of Insurance would certainly remain the same, as we have declined insuring chunam at any rate, from the incapability of the Sylhet Boats in general.

26. I have never heard of any delay in passing the large Rivers—except for the Tides, and sometimes for a day or two, when blowing very hard.

13. [2]Should the new communication admit of Boats passing with greater facility than through [3]Tolly's Nullah when they meet with such obstructions, great advantages would be obtained by reducing the delays and difficulties the Boats in this Nulla are so constantly exposed to, for sometimes it takes a boat two days to go even from Calcutta to Gurreah Haut.

(2) Paper E. para.
(3) Paper E. para. :

14. I certainly conceive the Native Boatmen would prefer the proposed route, from all the information I can obtain from them, in preference to the old one; as it is presumed they would have good tracking ground all the way, which is what they are so desirous of.

27. I am decidedly of opinion that the boats would, without hesitation, proceed and not wait the opening of the other channels when this new Cut is effected, in consider-

ation of its being less laborious, and more convenient to them, for they would at all times be able to cook their victuals on shore, which is almost the only objection (the Hindoos particularly) have to the Sunderbund.

(1) Paper E. para. 46.

28. [1]I think great value may be attached to it, as a place of safety for Boats laden with valuable Cargoes to resort to in the South-west Monsoon to wait for their consorts or final dispatch (as several Boats often form one dispatch), as also for those Boats coming down the Country with valuable Cargoes to stop and remain in till a favorable opportunity offers of their coming down to the Calcutta Ghauts, or till they inform the Consignees of their arrival, and receive their instructions where to come to, as well as for a complete shelter from the storms and Bores at all times.

*(Signed)* H. MATHEW,
*Secretary Ins. Company.*

# E 20. *b.*

(2) Paper E. para. 6.

[2]List **No. 4.**

18. The questions No. 18, 19, 20, 21, 22, 23, I must reply to all under one head, for the same reasons as stated in the preceding List **No. 3,** not having the means to [of] particularizing each distinct passage; from 1st May 1816, to 30th April 1821, a period of 5 years, we insured by the Bhugruttee 1502 Boats of all descriptions, estimated to carry 846, 300, Mds. only 3 of which were lost, estimated to carry about 2000 Maunds, and one small Boat of 300 Maunds, laden with Treasure (10,000 Dollars) at Sooty, by the Banks falling on her, she having immediately sunk in deep water; no traces of her has ever been discovered; two of the guards were drowned.

Qy. 23 & 24. This is answered by the same question No. 22 in List **No. 3,** in respect to the Sunderbund passage.

17. We have met with several losses, and I have heard of many others between Koostee and Bugwangolah, during severe North-Westers, but I never heard it was attributed to any particular dangers in that passage, and I do not consider them of greater extent than in an equal distance in other parts of the great River; we have lost 8 Boats in all of about 3000 Maunds.

25. My knowledge of the River does not extend so far back as 20 years, but for the last 12 years I do not recollect that these Rivers have ever been closed more than three months in any year at the same period of time.

*(Signed)* H. MATHEW,
*Sect. R. Ins. Company.*

# E 20. c.

## List **No. 6.**

[1]I do not know any greater advantages, that in enabling these Goods to come more early into the market, which in some cases may be considered of material consequence. (1) Paper E. para. 6.

2. This is replied to by the same question No. 28, in List **No. 3.**

3. In the present state of the markets, I do not consider the Trade with the Western Provinces can bear any additional per centage; and should Trade revive, a small one could only be required, which could not much affect it.

4. I am not competent to answer this question, but I know the article of Fire-wood alone has, within these last seven years, nearly doubled its price.

No. 5 and 6 are replied to by Question No. 24 in List **No. 3.**

No. 7, 8, 9, and 10. I am not competent to answer satisfactorily.

*(Signed)* H. MATHEW,
*Sec. R. Ins. Company.*

# [2]E 21.

(2) Paper E. para. 6.

To MAJOR FAITHFULL,
*Secretary to the Committee on Lieut. Schalch's projected Canals.*

SIR,

I have the pleasure to acknowledge the receipt of your letter dated the 15th December, with its several enclosures, and to return the list of inquiries transmitted to me, with such answers as, from my limited acquaintance with the subject, I am enabled to make; they are generally confirmations of a few points stated in Lieut. Schalch's Memoir, which in truth is so full and perfect, as to render it difficult for another to add any thing new.

On so important a question as the practicability of opening the proposed Communication, and keeping it so, I feel myself incompetent to form a judgment, yet I think I may safely assert, that, if Government should resolve on prosecuting the undertaking in discussion, the knowledge of that fact will be hailed with gladness by all, and, of course, more especially by those whose interests are immediately connected with this Navigation.

I have spoken to many Natives on the above mentioned subjects, and have[3] found that feeling to be invariably prevalent; but independent of this, my opinion is formed on these simple facts—the route in question is the only one between the Upper, the Eastern, and the Western provinces, that continues open throughout the dry season; consequently every facility and security that can be given it, must be an important benefit to the country. The passage by the Soonderbunds is comparatively tedious, inconvenient, and during one half of the year hazardous,—disadvantages which will be obviated by opening the new communication; and the expense proposed to be incurred, appears to me but small, when the benefits which may fairly be anticipated from it, are brought into account. (3) Paper E. para. 30.

I have, &c.
*(Signed)* C. PHILLIPS.

CULNA,
*January 15th*, 1822.

# E 21. *a.*

## List No. 3.

ON THE NAVIGATION THROUGH THE SOONDERBUNDS, OBSTACLES, ADVANTAGES, &c. &c.

2. I know of no such depositions, yet my answer to Query No. 3, suggests that they must occur.

(1) Paper E. para. 26.

3. Supposing the soil to be of one quality, I should[1] say, that as far as regards a tendency to corrode the banks, the influence of the tides was much the same as that of a regular flow of water in one direction,—because in two instances, I have found the destruction of the banks to be very great from the effect of the ebb and flow, namely at Culna and Soladana; at Culna the channel of the River has become nearly double its former width sometime back; you will understand that this change has not occurred altogether under my own eye, yet I am convinced of the fact, from what I witnessed last rains, and also by inquiry; I know that about 15 years ago the former Salt Agents of Roymungul possessed a house at this place, which was built at a considerable distance from the *bank* of the River, say 50 or 60 yards, not a trace of which at present exists; but this appears to apply solely to the permanency of the bank; a change of the course of the River seems improbable, from the tides acting in two opposite directions; and I also beg particularly to remark, that these facts do not, I think, affect the position laid down by Lieutenant Schalch as to the security of the banks on the line of his proposed communication through that country; the ground is low, whereas at Culna it is high, and the soil of a light loose nature, differing from every other that has falled under my observation between the two places.

(2) Paper E. para. 27.

[2]It would I think tend to increase the cultivation, for I have remarked that the clearing of the Soonderbund woods has been more extensive near the borders of good navigable streams than at other places.

9. The first part of this Query cannot easily be answered from any individual observation or knowledge. I have been given to understand that the losses which have occurred in the Soonderbund Navigation, on this side of Mooktarpoor, might be averaged at 5 and 6 Boats annually during the last five years:—some from the effect of bad weather, others by running on the hidden stumps of trees. The Salt Boats suffer particularly from the necessity they are under of moving in all weathers. Lieutenant Schalch's project would assuredly obviate the dangers of the present Navigation, inasmuch as the hazardous parts of the Soonderbunds will be altogether avoided thereby.

(3) Paper E. para. 27.

11. [3]In fine weather a merchant Boat of ordinary size, 500 or 600 Mds. will pass in seven or eight days. Boats for 1000 Mds. in ten and twelve days. Sowary Boats and Boats unladen, in four and five: during those months when bad weather is prevalent, a delay of three and four days more will usually occur.

(4) Paper E. para. 23.

12. [4]The heads of the following Rivers, the Roymungle, the Jubjubbea, the Seebsa, and Pussur, when the Southern Monsoon prevails, it is difficult for heavy Boats to work against the wind, even with the help of the ebb tide, there being no tracking ground after quitting the cultivated country.

(5) Paper E. para. 19.
(6) Paper E. para. 23.

13. [5]I do not know much on this point, but having passed through[6] Tolly's Nullah several times, I think that nothing can be more inconvenient than it is, and consequently that a communication at the back of the Circular Road, would be in every way preferable—indeed, this I regard as a principal advantage to be expected from the scheme in discussion.

14. I think so certainly, for the following reasons: In the old Route should a storm occur, the Boats are under the necessity of sustaining its violence at a distance from the River banks, on the frail security of a Native anchor and cable. From the absence of any tracking ground, after leaving the cultivated parts, Boats must, of necessity, wait at certain points for a favourable change of tide, which, during the stormy season, subjects them to endure a greater portion of bad weather than might otherwise be requisite,—and this in the most unfavorable parts of the Navigation. The dandees at the same time suffer from their apprehensions of tygers, the danger of cooking their provisions on shore (for they will do so in spite of every thing) and the want of fresh water. Not any of these inconveniences are likely to exist in Lieutenant Schalch's new communication, and it appears to me, therefore, that a preference will invariably be given, unless perhaps in the cold weather, when a few Boats may prefer the present Route. Paper E. para.

15. In the Seristah of the Salt Agent of the 24 Purgunnahs I suspect accounts of this matter will be found; the person who I understand contracted with Mr. Goodlad to open the Creek, is a resident of Dayhatta near Bangundy, his name Subul Mundul; it is probable that from him the required information may be gained.

23. Hindoo dandees starting from Culna to proceed by the Soonderbund Route to Calcutta, require higher wages than the Mussulmen; if the latter receive three Rupees per mensem, the Hindoo demands three Rupees eight annas and twelve annas or four Rupees.

*(Signed)* C. PHILLIPS, *Assistant.*

## [1]E 21. *b.*

(1) Paper E. para. 6.

### List No. 5.

3. I do not distinctly understand whether this question applies to the produce of the country about Culna, or to the general traffick between the Eastern, the Upper, and the Western Provinces, which passes to and fro by the Culna Route; if it is the former, I can only say that the productions here are of a similar description to what are usually met with throughout Bengal.

But I am inclined to believe the latter is the sense in which it should be taken, and I shall therefore give the best idea I can of the extent of the traffick, by shewing an Estimate of the number of Boats which pass this place monthly to and from Calcutta; this calculation is made on the Boats which have been counted at one or two periods, from the result of inquiry and my own observations; I beg however to observe, that it is a mere Estimate. (2) Paper E para. 39.

| | |
|---|---|
| In January, | 2,000 |
| February, | 1,500 |
| March, | 1,000 |
| April, | 1,000 |
| May, | 800 |
| June, | 300 |
| July, | 250 |
| August, | 250 |
| September, | 500 |
| October, | 1,500 |
| November, | 1,500 |
| December, | 1,500 |
| Total, | 12,100 |

In addition to this number, those Boats which now go by the Soonderbund Route South of Culna (via Rampol) will no doubt prefer the new communication, since they now, for the expedition, choose the Jungle passage in preference to that of the cultivated Country, they may be taken at 100 per month, for six months of the year.

As to the nature of this Traffick I can not offer any remarks, being unacquainted with the subject; neither am I able to state at all distinctly what the Tonnage may be, perhaps if five-sixths [of]* 12700 [12,100] Boats above mentioned are accounted as Merchant's Boats, it would not be far from the fact; $\frac{2}{6}$ Boats of 1,000 Mds. and upwards, and $\frac{3}{6}$ as Boats of common size, 500 and 600 Mds.; but these are points which no doubt may be clearly ascertained in Calcutta.

Sic in original.. J. M.

Considerable numbers of these Boats come from the Birmah Country,—they are commonly denominated Mug Boats, perhaps correctly so.

4. The annual produce of this Agency has usually been near 600,000 of Maunds of Salt; in the transportation of this quantity, perhaps 1200 Boats may be employed; 300 of 1000 Maunds each, 500 of 500 Mds. and 400 Boats of 300 and 400 Mds. each; but you will understand that these Boats do not come altogether from Calcutta, or proceed there; the greatest proportion of this Salt is distributed about the District lying to the East of Calcutta; I do not possess any records here from which I can state exactly how it is.

*(Signed)* C. PHILLIPS,
*Assistant.*

(1) Paper E. para. 6.

## (1)E 22.

To CAPTAIN R. C. FAITHFULL,
*Secretary Special Committee, Lieutenant Schalch's Plan, Calcutta.*

Sir,

I have to acknowledge the receipt of your Letters dated the 17th December and 14th January last, together with their enclosures.

2. My knowledge of the Navigation of the Soonderbunds being very limited, having had occasion to pass only twice by this Route in my way to and from this place and Calcutta, it is not in my power to furnish any satisfactory information on the subject of Lieutenant Schalch's Plans for opening a permanent Communication with the Eastern and Western Provinces.

3. In communication however with Mr. W. K. Jackson, one of the uncovenanted Superintendents of this Salt Agency, and who formerly resided at Culna for many years, I am enabled to submit, for the information of the Committee, a reply to some of the Queries referred to in your Letter, and which I have the honor herewith to enclose.

I have, &c.

*(Signed)* T. PLOWDEN,
*Salt Agent.*

Bullooah Division.
Noacolly,
*The 27th March,* 1822.

# E 22. *a.*

Mr. W. K. JACKSONS's Replies to the Queries on the Navigation through the Sunderbunds, &c. &c.

2 (1)Goodlad's Creek, which was excavated in 1795-96, appears to me to have undergone no change whatever, nor become at all obstructed. (1) Paper E. para. 12.

3. (2)The ebb and flood of the Tides, when moderate, have little influence on the permanency of the banks of the Streams or Canals, and are more favourable to their duration than regular currents, which tend to Depositions of Mud and Sand, and by altering the Channel endanger the Banks. (2) Paper E. para 26.

At (3)Bullooah the average rate for digging Tanks is one Rupee three annas per cubit. (3) Paper E para. 50.

The Soil of Noacolly and its adjacent parts being alluvial, Tanks are seldom excavated more than from six to nine feet, at which depth water is found.

9. Lieut. Schalch's project will tend to remove many Dangers of the present Soonderbund Passage, Loss of Lives by tygers, and of Boats from the intricacy of the Navigation.

10. The particular points at which losses are usually sustained, are the two Cooleeas, and the head of the Roymungle River; great numbers of Boats from Sylhut with Chunam, from Baukergunge with Rice—chiefly belonging to Europeans, and from Cutchua and Joypore with Mats and Grain, have been lost within my recollection, particularly in the Choota Cooleea, by running on the stumps of Sunken Trees, and many others, in hard blowing weather, at the unsheltered point of the (4)Roymungul. Crossing the Seepsahr is attended with much danger, this part being more infested with tygers than any other in the Sunderbunds, nor can a boat, with any regard to safety, anchor near the shore, nor is it uncommon to see a Bamboo erected with an inverted pot on the head of it to mark the place (as a warning to others) whence some person had been carried off by a tyger. Some years ago an Overseer of the Roymungul Agency in his way to Calcutta anchored incautiously too near the shore in the Seepsahr, when about 8 in the evening he was dragged from his Boat by a tyger, and several of his people wounded in their attempts to defend him; many others have also lost their lives in the Sunderbunds by Alligators, which formerly abounded with them in the Roopsah and Pussur Rivers, and may at this time, for aught I know. (4) Paper E. para. 23.

10½. Losses by Robbery were frequent and extensive formerly, until the Dekaits were suppressed by the activity of Mr. Rock, the then Magistrate of Jessore; they were generally committed in the Jubjubbea or Budder Gatchy and Seepsahr Rivers.

14. The New Route would certainly remove the aversion of the Native Boatmen to the Sunderbund Passage, and become an object of preference for the reasons assigned in No. 10.

18. A reference to the Insurance Offices in Calcutta will answer this Question.

28. Merchant's Boats of every description would gladly have recourse to the Basin for protection from the Bores in the Hooghly River during the Freshes or Rains.

(True Copy.)

*(Signed)* T. PLOWDEN,
*Agent.*

NOACOLLY,
*27th March,* 1822.

# E 23.

To CAPT. R. C. FAITHFULL,

*Secretary to the Special Committee on Lieutenant Schalch's Plans.*

SIR,

(1) Paper E. para. 6.

1. I have the honor to acknowledge your letter, No. 75, dated 31st December 1821, together with its accompaniments, a printed copy of the Memorial, [Memoir] an engraved Map, and a List of 27 Questions on which the Committee seek information. The general purport of these regards the obstruction to the Navigation in the Bogrutty, and which, as far as I know, is perfectly accurate, although from particular circumstances of very late rains, as in 1820, it continued longer free from difficulties, and about 12 days ago, in crossing at Berhampore, the Mangee informed me that there were Eight hauts of water, and still more towards the junction with the Ganges, through a Cut made by Col. Parlby;—for the accuracy of this information I do not pretend to vouch, but give it as it was told me.

2. The Goods sent down by me are loaded at Cutwa, close to which there was a very troublesome sand, but whether that has been removed, and deep water acquired, I know not. A Godown I had on the banks of the River, a good distance from it, during the two past years, has fallen into it, and the water runs even more to the Westward than where it stood; below this point, at Augurdeep, there has, as long as I remember, always been great obstruction to the Navigation of the River; and more or less till passing the Jelinghy; I have observed indication of the Tides at the Mirzapore Nullah, though but slight, but from that point, I do not believe there is any serious difficulty in the River to prevent Boats navigating it to Calcutta.

3. My station is considerably inland, and hearsay information of the River's facilities or obstructions could be little relied in; but to the 12th Question—"Supposing a free passage has hitherto existed, what measures would seem calculated to secure it so, and counteract the formation of obstacles?"—there is none that I could recommend so likely, as to restore the Jungles on the banks of the Adzi, and other Rivers or more properly mountain torrents, which disembogue at Cutwa; for they did hold and prevent a body of Sand from falling into the torrents, which now raises there beds above the Level of the country, and in very high floods, carries into the Bogrutty such a quantity, as, in my opinion, has caused the obstruction both at Cutwa and Augurdeep. I should have been happy had my local knowledge enabled me to solve the objects of your reference; but there are scarcely any of them to which I can give an answer from my own observation.

I am, &c.

(*Signed*) J. CHEAP,
*Resident Soonamoky.*

SOOROOL,
*14th January* 1822.

# E 24.

To LIEUT. R. C. FAITHFULL.
*Secretary to the Special Committee on Lieutenant Schalch's Plans.*

SIR.

I have the honor to acknowledge the receipt of your letter of the 2nd instant, and have now the pleasure of forwarding you the solutions you require.

2. They are all drawn up, you will observe, into a series of Tables, which have been compiled with as much care and attention as I have been able to bestow on them, considering the multiplicity of my own avocations, and the scantiness of the materials I have had to go upon.

3. A solution to several of the questions, however, I have not been able to give you, from their being of such a general nature, and so unconnected with any thing [which] depend on the branch of the Customs. Those however which I have given you, I beg leave to inform you are pretty accurate, as they have been collected from the Records of this Office, as well as from every other source of information that it has been in my power to procure; they will I hope tend to throw some light on the inquiries of the Committee.

I have, &c.
*(Signed)* A. SMELT.
*Acting Collector of Govt. Customs.*

MOORSHEDABAD.
GOVT. CUSTOM HOUSE.
*The 23rd January,* 1822.

# E 24. *a.*

List **No. 4.**

1. I cannot say as to the passage by the Mathabangah and the Jellinghee; but the passage by the Bhaugrutty, on which this Custom House is situated, has been obstructed for Boats of from 3 to 500 Maunds burden, in those months almost every year, owing to causes to be explained by the subsequent answers.

2. The Navigation in the Bhaugrutty for Boats of great burden is generally closed in the month of February, and obstructions remain in the River till the setting in of the rains. The trade by water, however, in the dry months is very limited, as none of the Grain Merchants, nor those dealing largely in Sugar, Oil, and Oil-seeds, Gunnies, and other gruff articles bring in these goods in these months in any considerable quantities, but wait till the opening of the River; so that instances of Boats being obstructed in the river for any length of time are not many, and do not occur above once or twice in the year.

3. In the Bhaugrutty the obstructions have hitherto existed at Muttrapore Calna, Balore Gunge, Hoosalpore Cutwa, Catee Gunga, and the Tooly; the nature of these obstructions being generally sand banks, and other impediments thrown upon by the River; and

the lowest depth of water at each of these places, I have been informed by the Mangies and other people, has not exceeded two cubits in the dry months for each year.

4. More sand accumulating at the head of the River, and choking up the passage in one year [more] than in another, must, I should imagine, account for such variations.

The measures which have hitherto been resorted to, to keep open the Navigation by the Bhaugrutty River, have been the removal of the sand and other sediments collected at the Sooty, and the deepening of its mouth by Major Parlby when not passable by Boats of burden; I cannot say as to the expense, and as to the success resulting from these measures,—it has hitherto been but partial, as the Sooty has closed up again by fresh beds of sand, and other matter brought down by the River in its course.

6. My attention has not been directed to this subject, from no complaints having ever been made to me by the merchants, or by any individuals, as to the obstructed state of the River for navigation; or remedies ever applied for by any one in such a case,—I must therefore plead my inability to answer this Question.

7. The usual period taken up by Boats passing from Calcutta to the Ganges by the Bhaugrutty in the months of February, March, and April, is one month, and in the rains 15 days; and in passing from the Ganges to the Hoogly by the same route, in those months, is generally 14 days, and in the rains 5 days.

8. No:—no Merchandize has been delayed for the opening of the passage; when Boats for great burden are obstructed in their transit, the merchandize with which they are laden is generally taken out and put into smaller boats, and carried out of the River; this measure however is always attended with considerable expense and delay to the Merchants, as might be expected. Instances however have occurred of timbers having been delayed for the opening of the passage, but these instances have not occurred lately, as the dealers in this article of commerce now transport them before the waters begin to fall, viz. in September, October, and November.

10. At the Sooty 1½ cubit, at the Jellinghee 1 cubit, and at Mathabangah the same generally one year with another.

11. None at present for Boats of small burden; the passage by the Sooty is pretty clear this year, and will be so throughout the whole of this dry season, as it was cut the last year in order to facilitate the progress of His Lordship and his suite to the Presidency on their return from a visit to Malda.

12. I am unable to answer this question.

13. I cannot answer this question in a satisfactory manner, from my never having paid any attention to this subject, but that part of the Bhaugrutty which runs through Moorshedabad has not undergone any visible changes for these many years back—as the Great Gunges [Ghauts] of this City are all on the Banks of the River, and have occupied the same spot of ground on which they were originally built—now many years ago; nor has the situation of the Custom House been altered; but just about a mile below the Custom House, between it and Berhampore, the River makes some slight encroachments almost every year, from the waters continually gnawing and eating away the banks on each side, and this with more force as the current happens to strike more directly against them—Similar changes take place at Gysabad, and at several other places down the River.

14. None that I know of.

15. I cannot say, from my never having paid any attention to the subject—it being so irrelevant to my branch of the service.

16. More Sand, and other sediments, accumulating at the Head of the River in one year than in another, must, I should suppose, account for this variation.

18. (1)About 1650; I cannot say as to their Tonnage, from my never having kept a Register of them. (1) Paper E. para.

19. No Insured Boats were lost in the years 1815, 16, 17, 18, and 20.

| | | |
|---|---|---|
| The number that was lost in the year 1819 was, | .. .. .. .. | 3 |
| and that in the year 1821, or last year, | .. .. .. .. | 9 |
| Total in these two years, | .. .. | |

20. Not ascertainable from this Office.

21. The Total number of Boats that were lost by this route in the year

| | | |
|---|---|---|
| 1819, was, | .. .. .. .. .. .. .. .. | |
| In the year 1820, | .. .. .. .. .. .. | |
| In the year 1821, or last year. | .. .. .. .. .. | |
| Total, | .. | 9 |

None in those of the preceding years 1815, 16, 17, and 18.

22. This question, and the following one, I beg leave to refer you to the Insurance Offices in Calcutta for solution.—Their Registers and Returns of Boats, would at once shew what number of Boats insured in Calcutta, proceed to the Upper Provinces by these Routes annually, and what number are annually lost, as all Boats proceeding by the Hoogly and Jellinghee are almost in all instances insured in Calcutta.

24. The passage from Calcutta to the Ganges by the Sunderbunds in the dry season, is generally one month and a half, and in the rains two months. No Boats, however, going to Calcutta, proceed by the Sunderbunds in the rains, but take either the Bhaugrutty and the Jellinghee and Mathabhangah passages, as these passages in these months are always considered as the quickest, the safest, and attended with the least expense.

25. I cannot answer this question, but I think it could be easily solved by just inquiring at the different Ferries at the head of these Rivers, and of the people residing near to them, as it [is] generally at these heads that the obstructions begin.—Their answers would, I think, be satisfactory, from their intimate knowledge of these places.

27. I am not aware of any Outlets communicating with the Ganges through which a permanent communication with Calcutta could be established by either of these passages, and consequently I must express my inability to answer this question, as well as the following one, which is so closely connected with it.

(*Signed*) A. SMELT,
*Actg. Collr. of Govt. Customs*

MOORSHEDABAD,
GOVT. CUSTOM HOUSE,
*The 23d of January*, 1822.

(1) Paper E. para. 6.

# (1)E 25.

To CAPTAIN R. C. FAITHFULL,

*Secretary to the Special Committee Lieutenant Schalch's Plans.*

SIR,

I have to acknowledge the receipt of your Letter under date the 5th instant with the several enclosures stated to accompany it.

After an attentive perusal of these enclosures, I beg leave to state that my local knowledge is inadequate to the offering any opinion or observations on the Memoir and Plans of Lieutenant Schalch for cutting various Canals between Koolna and Calcutta, further than that on a general consideration of what that officer has stated, it appears to me far more likely that a communication during the dry season could be secured by the route

(2) Paper E. para. 38.

laid down by Lieutenant Schalch, than by any other tract between (2)Rajemahal and the Gurroy River; and that the obstacles to the suggested Canals from Rajemahal to the Bhaugrutty River are justly appreciated and pointed out by that officer.

I have, &c.

JUNGYPORE, (Signed) C. BIRCH.
*23rd January*, 1822

(3) Paper E. para. 6.

# E 26.

To R. C. FAITHFULL, ESQ.

*Secretary Special Committee Lieutenant Schalch's Plans.*

SIR,

I have the honor to acknowledge the receipt of your favor of the 5th instant with its enclosures, and have greatly to regret that a residence in the Northern parts of Purneah nearly during the whole period of my residence in India, upwards of twenty years, has necessarily occasioned a want of local knowledge sufficient to enable me to give a satisfactory elucidation to your inquiries,—and as a crude cursory opinion is not the one sought, or could be satisfactory to myself, I must be content simply to state, in general terms, that if the proposed object can be effected, it will prove an incalculable blessing to millions of our fellow subjects; in confirmation of this, I need only to state, that the whole Trade of the large and populous district of Purnea is suspended during at least six months of every year, for want of a safe and near passage to the Presidency.

Such is the dread of the one at present (through the Sunderbunds) entertained by the Boatmen and Merchants, that, to my certain knowledge, not a single boat ever made it from any part of the country (during the last twenty years) in which I resided, although the focus of Export of the whole District, and the principal Mart for the pro-

ductions of [1]Morung, Bootan, and Rungpore. In conclusion, I may add, that I have been myself a sufferer to the amount of Lacks of Rupees, from valuable Fleets of Timbers being left to the almost certain destruction of the Ganges, from not being able to enter the Bhaugrutty, Jelinghee, and Mathabhangah for want of water, and in a recent instance of their being excluded from the Mathabhangah, although there was water in abundance, by which I had a fleet of 46 boats entirely swampt. (1) Paper E. para. 36.

I have, &c.

SALKEA, *(Signed)* R. BARNES.
*January 25th*, 1822.

# [2]E 27.

(2) Paper E. para. 6.

To LIEUTENANT R. C. FAITHFULL,
*Secretary Special Committee Lieutenant Schalch's Plans, Calcutta.*

SIR,

I have the honor to acknowledge the receipt of your letter of the 8th instant, giving cover to Lieutenant Schalch's Memoir and Plans, and a List of Queries; in reply I beg leave to state, that not having resided on the spot, and my official duties having no connection to which the Queries refer, besides having made no regular observations, I do not feel qualified to furnish you with any information on the subject, which you may be supposed to have already derived from better authority. It seems however to me that most of the Queries may be answered with sufficient correctness by the Custom House, Insurance Company, the Collector of the Tolls in the Mattabhangha, and others may be done by putting the Questions in the Public Prints, which would be answered correctly by such persons on the spot that may have taken regular notes or remarks for their own satisfaction, and who may have devoted a good deal of their time, and for years, on River Surveys, and only such persons may be qualified to give ample information as to what may be the advantage or otherwise of the proposed Plan in question.

I should have been most happy, had it been in my power, to have given my sentiments and suggestions [as required,] but my duties not leading me in the direction of the Plan submitted, I have not been in the way to make any observations or remarks upon the several and most particular points, to enable me to comply with your request.

I have, &c.

NATORE, *(Signed)* R. THOMAS W. BETTS,
*25th January*, 1822. *Superintendent Embankments Zillah Rajeshye*

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(1) Paper E. para. 6.

## [1]E 28.

To CAPTAIN R. C. FAITHFULL,

*Secretary to the Special Committee on Lieut. Schalch's Plans.*

SIR,

In reply to your letter of the 12th instant, No. 99, not having any acquaintance with the Eastern Provinces, I am unable to give any information; but as regards the Western, within my range, I do not perceive any obvious benefit likely to arise from the proposed Canal.

(2) Paper E. para. 39.

2. [2]From 1000 to 1200 mds. of Silk are sent from my Residency, by Cutwa; the article is valuable, and the bales require room, so that for 100 mds. a boat of about 250 mds. burthen is usually employed, and is generally a week to ten days in the dry season, and often as long in the rains, from the uncertainty of the weather. As far as I comprehend the subject, the advantages to be derived from the Canal must be limited to the facilities of conveyance to and from the Eastern Provinces to the Presidency—and if that makes an essential difference in the cost, in that proportion it ought to diffuse generally in the dispersion for retail.

I am, &c.

(*Signed*) J. CHEAP,
*Rest. Soonamookey*

SOOROOL,
*16th January*, 1822.

(3) Paper E. para 6

## [3]E 29.

No. 59.

To CAPTAIN R. C. FAITHFULL,

*Secty. to the Special Committee, appointed by Govt. to Report on Lieut. Schalch's Plans*

Board of Trade.

SIR,

(4) Paper E para 39.

(5) Paper E. para. 46.

I am directed by the Board of Trade to acknowledge the receipt of your Letter under date the 18th of January last, with its Enclosures; and in reply to transmit to you, for the information of the Committee, the annexed Copy of a letter dated the 30th ultimo, from the Officiating Sub. Export Warehouse-Keeper, together with the original statement to which it refers, and to observe, that, in the opinion of the Board, the formation of a [5]Basin at Chitpore would be very beneficial for the interests of the Honorable Company, as the Committee will perceive from the situations of the Company's Factories, enumerated in the abovementioned statement, that the greater part of the Public Investment is brought to the Presidency upon Boats in whose tract Chitpore lies.—Many of the Boats, especially the

**large Patallah Boats from Etawah, Calpie, and Patna, laden with Cotton and Saltpetre, are obliged to remain at Balee Ghaut, on the opposite side of the River, for several days, watching an opportunity, during the prevalence of the Bore, to cross over to Chitpore, where they lie exposed until a favorable opportunity occurs for their dropping down to Calcutta.—**

**2. I am further directed to express the regret of the Board that they are not enabled to afford the Committee any further information on the points alluded to in your letter and its enclosures.**

I am, &c.

*(Signed)* W. NISBET,
*Secretary.*

FORT WILLIAM,
*The 2d April*, 1822.

## E 29. *a.*

To GEORGE UDNY, ESQ.,
*Export Warehouse Keeper*

SIR,

I now do myself the pleasure to furnish the Statement called for in Mr. Secretary Nisbet's letter of the 1st ultimo, showing the periods of Dispatch from several Factories, as also the dates of Arrival in Calcutta, of the different articles composing the Honorable Company's Investment, together with the Gross Amount, in Maunds, of Tonnage employed annually in transporting the same.—The whole comprehending a period of five years.

With regard to the Piece Goods, it was not practicable to do more than ascertain the Tonnage agreeable to the Company's computation. The Tare of these Bales has also of necessity been omitted.

An Abstract will be found in the last sheet, pointing out the total amount of Tonnage of the different Articles imported in each successive year.

I am, &c.

*(Signed)* F. MACNAGHTEN,
*Offg. Sub. E. W. H. Kr.*

A true Copy.

*(Signed)* W. NISBET,
*Secretary.*

EXPORT WAREHOUSE,
*The 30th March*, 1822

## E 29. *a.* (1)

**Statement of the Gross Amount, in Maunds, of Tonnage annually employed in bringing the Honorable Company's Investments to Calcutta, shewing the Periods of Dispatch from the several Residences, and dates of Arrival in Calcutta from 1816 to 1820, inclusive.**

# E 29. *a.*[1]—*(Continued.)*

| Factories. 1816. | Nett. Weight. as per Invoices. Fy. Mds. Sr. Chs. | Estimated. Tare. Fy. Mds. Sr. Chs. | Total Gross. Weight. Fy. Mds. Sr. Chs. | Grand Total. Fy. Mds. Sr. Chs. | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|---|
| **Raw Silk.** | | | | | | |
| Bauleah, .... | 173 36 15 | .. .. | .. .. | .. .. | 7 Aug. 1816. | 23 Aug. 1816. |
| | 235 9 6 | .. .. | .. .. | .. .. | 22 Nov. | 3 Dec. |
| | 409 6 5 | 41 26 4 | 450 32 9 | | | |
| Commercolly, | 120 26 8 | .. .. | .. .. | .. .. | 24 Jan. | 2 Feb. |
| | 139 19 4 | .. .. | .. .. | .. .. | 12 Feb. | 21 Ditto. |
| | 421 9 2 | .. .. | .. .. | .. .. | 7 Aug. | 14 Aug. |
| | 57 25 [illegible] | .. .. | .. .. | .. .. | 7 Ditto. | .. Ditto. |
| | 47 7 6 | .. .. | .. .. | .. .. | 28 Nov. | 9 Dec. |
| | 21 38 12 | .. .. | .. .. | .. .. | 28 Ditto. | 9 Ditto. |
| | 173 29 4 | .. .. | .. .. | .. .. | 20 Dec. | 31 Ditto. |
| | 69 13 6 | .. .. | .. .. | .. .. | 31 Ditto. | 29 Jan. 1817. |
| | 1,051 9 8 | 142 29 4 | 1,193 38 12 | | | |
| Cossimbazar, | 150 0 0 | .. .. | .. .. | .. .. | 25 Jan. | 2 Feb. 1816. |
| | 100 0 0 | .. .. | .. .. | .. .. | 12 Feb. | 24 Ditto. |
| | 92 8 8 | .. .. | .. .. | .. .. | 22 Ditto. | 4 March. |
| | 228 2 0 | .. .. | .. .. | .. .. | 13 Aug. | 20 Aug. |
| | 114 12 0 | .. .. | .. .. | .. .. | 9 Sept. | 14 Sept. |
| | 284 0 0 | .. .. | .. .. | .. .. | 8 Nov. | 16 Nov. |
| | 64 1 8 | .. .. | .. .. | .. .. | 22 Ditto. | 5 Dec. |
| | 1,032 24 0 | 94 11 0 | 1,126 35 0 | | | |
| Hurripaul, .. | 16 1 13 | .. .. | .. .. | .. .. | 28 Feb. | 7 Mar. |
| | 65 27 8 | .. .. | .. .. | .. .. | 4 Mar. | 14 Ditto. |
| | 110 39 10 | .. .. | .. .. | .. .. | 4 July. | 8 July. |
| | 80 1 14 | .. .. | .. .. | .. .. | 31 Dec. | 3 Jan. 1817. |
| | 272 30 13 | 30 33 0 | 303 23 13 | | | |
| Malda, .. .. | 100 1 2 | .. .. | .. .. | .. .. | 5 Feb. 1816. | 22 Feb. 1816. |
| | 70 0 13¾ | .. .. | .. .. | .. .. | 26 Ditto. | 11 Mar. |
| | 128 1 10 | .. .. | .. .. | .. .. | 30 April. | 28 May. |
| | 69 7 6½ | .. .. | .. .. | .. .. | 24 Oct. | 6 Nov. |
| | 367 11 ¼ | 52 36 0 | 420 7 ¼ | | | |
| Gonatea, .... | 120 3 3 | .. .. | .. .. | .. .. | 22 Jan. | 31 Jan. 1816. |
| | 60 1 9 | .. .. | .. .. | .. .. | 30 Ditto. | 8 Feb. |
| | 112 2 11 | .. .. | .. .. | .. .. | 20 Feb. | 5 Mar. |
| | 61 29 15 | .. .. | .. .. | .. .. | 14 Aug. | 27 Aug. |
| | 80 7 7 | .. .. | .. .. | .. .. | 27 Ditto. | 3 Sept. |
| | 80 7 7 | .. .. | .. .. | .. .. | 2 Oct. | 15 Oct. |
| | 80 7 7 | .. .. | .. .. | .. .. | 16 Dec. | 28 Dec. |
| | 111 9 7 | .. .. | .. .. | .. .. | 31 Ditto. | 15 Jan. 1817. |
| **Tussa Silk.** | 10 0 0 | .. .. | .. .. | .. .. | 20 Feb. | 5 Mar. 1816 |
| | 16 0 0 | .. .. | .. .. | .. .. | 14 Aug. | 27 Aug. |
| | 2 24 8 | .. .. | .. .. | .. .. | 31 Dec. | 15 Jan. 1817 |
| | 734 13 10 | 121 9 8 | 855 22 10 | | | |
| | Carried over, | .. .. | 4,350 39 12¼ | | | |

# E 29. a.[1]—(Continued.)

| Factories. 1816. | Nett. Weight as per Invoices. Fy. Mds. Sr. Chs. | Estimated Tare. Fy. Mds. Sr. Chs. | Total Gross Weight. Fy. Md. Sr. Chs. | Grand Total. Fy. Md. Sr. Chs. | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|---|
| | Brought over, | | 4,350 39 12¼ | | | |
| Jungipore, .. | 96 2 13 | | | | 26 Jan. | 6 Feb. 1816. |
| | 80 2 2 | | | | 7 Feb. | 19 Ditto. |
| | 21 10 8 | | | | 7 Ditto. | 19 Ditto. |
| | 66 1 13 | | | | 20 Ditto. | 3 March. |
| | 178 4 15 | | | | 10 [illegible] | 22 July, |
| | 100 1 4 | | | | 6 [illegible] | 14 Aug. |
| | 164 2 8 | | | | 9 [illegible] | 16 Sep. |
| | 95 31 0 | | | | 31 Dec. | 14 Jan. 1817. |
| | 801 16 15 | 112 31 4 | 914 8 3 | | | |
| Radnagore, .. | 116 12 7 | | | | 19 Jan. | 24 Jan. 1816. |
| | 41 27 13 | | | | 12 Feb. | 17 Feb. |
| | 17 19 5 | | | | 19 Ditto. | 8 March. |
| | 272 24 2 | | | | 25 Sep. | 5 Oct. |
| | 273 16 0 | | | | 5 Nov. | 12 Nov. |
| | 150 29 12 | | | | 17 Dec. | 24 Dec. |
| | 872 9 7 | 112 5 4 | 984 14 11 | | | |
| Rungpore, .. | 52 0 0 | | | | 17 Feb. 1816 | 30 Mar. 1816. |
| | 94 5 12 | | | | 27 May. | 3 July. |
| | 106 6 0 | | | | 18 Ditto. | 15 Ditto. |
| | 101 38 0 | | | | 16 July. | 19 Aug. |
| | 62 8 0 | | | | 24 Dec. | 29 Jan. 1817. |
| | 200 5 0 | | | | 31 Ditto. | 27 Feb. |
| | 616 22 12 | 93 36 0 | 710 18 12 | | | |
| | | | | 6,960 1 6¼ | | |
| SALTPETRE. | | | | | | |
| Etawah and Calpee, .... | 8,632 20 0 | | | | 18 Jan. | 31 July, 1816. |
| | 2,137 20 0 | | | | 6 March. | 25 Ditto. |
| | 2,685 0 0 | | | | 19 Ditto. | 9 Aug. |
| | 8,055 0 0 | | | | 31 July. | 10 Oct. |
| | 7,500 0 0 | | | | 31 Aug. | 19 Nov. |
| | 7,400 0 0 | | | | 5 Oct. | 21 Jan. 1817. |
| | 36,410 0 0 | 1,638 18 0 | 38,048 18 0 | | | |
| Patna, .. .. | 15,812 0 0 | | | | 10 Aug. | 7 Oct. 1816. |
| | 9,200 0 0 | | | | 19 Ditto. | 8 Ditto. |
| | 1,000 0 0 | | | | 14 Ditto. | 9 Ditto. |
| | 4,862 0 0 | | | | 20 Ditto. | 10 Ditto. |
| | 12,000 0 0 | | | | 14 Sept. | 2 Nov. |
| | 7,500 0 0 | | | | 30 Ditto. | 23 Ditto. |
| | 8,228 0 0 | | | | 24 Oct. | 6 Dec. |
| | 5,668 0 0 | | | | 6 Dec | 1 Feb. 1817. |
| | 64,270 0 0 | 1,707 6 14 | 65,977 6 14 | | | |
| | | | | 1,04,025 24 14 | | |
| SUGAR. Benares, | 1,971 4 8 | 51 16 4 | 2,022 20 12 | 2,022 20 12 | 2 Aug. | 19 Sept. 1816. |
| COTTON. Etawah and Calpee..... | 15,997 31 8 | 960 25 6 | 16,958 16 14 | 16,958 16 14 | 29 Oct. 1816. | 18 April 1817. |
| | | | | 1,29,966 23 14¼ | | |

# E 29. *a.*[1]—*(Continued.)*

| Factories. 1816. | Quantity, Pieces, and Tonnage as per Invoice. | Pieces & § Tonnage. | Total Pieces and Tonnage. | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|
| PIECE GOODS. | | | | | |
| | Pieces ton. cwt | | | 31 Mar. 1816. | 11 May, 1816. |
| Benares, .... | 9,113 21 15 | | | 15 Oct. | 13 Nov. |
| | 1,600 4 0 | | | 9 Nov. | 13 Dec. |
| | [illegible]3 11 | | | 24 Dec | 21 Jan. 1817. |
| | [illegible]5 12 | Piece. | Tons. Cwt. | | |
| | | 39,438 0 0 | 94 18 0 | | |
| Chittagong, .. | 16,010 32 17 | | | 12 Jan. 1816. | 16 Feb. 1816 |
| | 11,070 23 11 | | | 19 Feb. | 22 March. |
| | 25,040 52 10 | | | 19 Nov. | 26 Dec. |
| | | 52,120 0 0 | 108 18 0 | | |
| Cossimbazar, | 13,000 12 5 | | | 31 Jan. | 8 Feb. |
| | 10,496 10 3 | | | 27 Feb. | 7 Mar. |
| | 5,028 5 6 | | | 19 Mar. | 27 Ditto. |
| | 8,687 9 0 | | | 30 April. | 14 May. |
| | 7,000 6 15 | | | 18 Oct. | 24 Oct. |
| | 10,000 9 2 | | | 30 Dec. | 7 Jan. 1817. |
| | | 54,211 0 0 | 52 11 0 | | |
| Dacca, .. .. | 50 0 3 | | | 20 Jan. | 10 Feb. 1816. |
| | 3,888 9 5 | | | 24 Dec. | 4 Jan. 1817. |
| | | 3,938 0 0 | 9 8 0 | | |
| Golagore & Bainagore, | 7,239 13 1 | | | 4 Feb. | 12 Feb. 1816. |
| | 3,912½ 8 0 | | | 16 Mar. | 24 April. |
| | 4,245½ 8 9 | | | Ditto. | 28 May. |
| | 8,057 25 14 | | | 3 Dec. | 9 Dec. |
| | | 23,454 0 0 | *46 15 0 | | |
| Hurriaul, .. | 1,385 2 16 | | | 9 Jan. 1816. | 24 Jan. 1816. |
| | 675 1 9 | | | 9 Feb. | 20 Feb. |
| | 620 1 4 | | | 16 Ditto. | 28 Ditto. |
| | 2,600 5 16 | | | 21 Nov. | 7 Dec. |
| | | 5,280 0 0 | 11 5 0 | | |
| Keerpoy, .... | 291 0 14 | | | 18 Jan. | 24 Jan. |
| | 1,218 3 0 | | | 18 Mar. | 25 Mar. |
| | 1,817 4 10 | | | 18 Dec. | 24 Dec. |
| | | 3,326 0 0 | 8 4 0 | | |
| Midnapore, .. | 155 0 7 | | | 18 Jan. | 24 Jan. |
| | 1,955 4 17 | | | 18 Dec. | 24 Dec. |
| | | 2,110 0 0 | 5 4 0 | | |
| Hurripaul, .. | 3,000 5 12 | | | 4 Mar. | 7 Mar. |
| | 2,141 4 1 | | | 3 July. | 6 July. |
| | 6,030 11 7 | | | 30 Dec. | 3 Jan. 1817. |
| | | 11,17 0 0 | 21 0 0 | | |
| Luckipore, .. | 33,280 50 8 | | | 15 Mar. | 9 April 1816 |
| | 39,540 64 7 | | | 5 Aug. | 3 Sep. |
| | 41,330 51 15 | | | 23 Sep. | 12 Oct. |
| | 22,640 49 17 | | | 25 Ditto. | 18 Ditto. |
| | 23,400 50 9 | | | 12 Dec. | 29 Jan. 1817 |
| | | †1,61,110 0 0 | 266 16 0 | | |
| Malda, .. .. | 435 1 2 | | | 30 April. | 28 May, 1816 |
| | 1,053 1 16 | | | 6 Dec. | 26 Dec. |
| | | 1,488 0 0 | 2 18 0 | | |
| Santipore, .. | 406 0 19 | | | 24 Jan. | 29 Jan. |
| | 717 1 6 | | | 24 Feb. | 29 Feb. |
| | 1,248 2 10 | | | 4 Dec. | 9 Dec. |
| | | 2,371 0 0 | 4 15 0 | | |
| | Carried over, | 3,60,017 0 0 | 632 12 0 | | |

§†Qy. 160190 J.M. *Qy. 55 : 4—J. M.

# E 29. a.[1]—(Continued.)

| Factories. 1816. | Quantity, Pieces, and Tonnage, as per Invoice. | Pieces and Tonnage. | Total Pieces and Tonnage. | Date of Dispatch | Date of Receipt. |
|---|---|---|---|---|---|
| Brought over, | | 3,60,017 0 0 | 632 12 0 | | |
| Rungpore. .. | 3,000 5 12 | | .. .. | 17 Jan. 1816. | 23 Mar. 1816 |
| | 3,650 7 7 | | .. .. | 17 Feb. | 30 Ditto. |
| | 3,300 7 0 | | .. .. | 16 July. | 19 Aug. |
| | 4,600 8 12 | | .. .. | 12 Sep. | 9 Oct. |
| | 4,000 10 6 | | .. .. | 31 Oct. | 9 Dec. |
| | 1,600 3 0 | | .. .. | 13 Dec. | 21 Jan. 1817. |
| | 3,000 8 0 | | .. .. | 31 Ditto. | 17 Feb. |
| | | 23,150 0 0 | 49 17 0 | | |
| Patna. .. .. | 2,000 4 0 | | .. .. | 27 Jan. | 19 Feb. 1816. |
| | 2,500 5 0 | | .. .. | 12 Feb. | 7 March. |
| | 10,083 20 4 | | .. .. | 29 June. | 30 July. |
| | 6,000 12 0 | | .. .. | 31 Aug. | 23 Sep. |
| | 3,000 6 0 | | .. .. | 26 Sep. | 15 Oct. |
| | 5,000 10 0 | | .. .. | 31 Oct. | 28 Nov. |
| | 5,000 10 0 | | .. .. | 3 Dec. | 30 Dec. |
| | | 33,583 0 0 | 67 4 0 | | |
| Burron. .. .. | 3,213 7 18 | | .. .. | 24 Jan. | 29 Jan. |
| | 3,557 8 13 | | .. .. | 27 Feb. | 29 Feb. |
| | 3,100 7 15 | | .. .. | 28 March. | 1 April. |
| | 4,027 9 2 | | .. .. | 4 Dec. | 9 Dec. |
| | | 13,897 0 0 | 33 8 0 | | |
| Soonamooky. | 1,211 1 15 | | .. .. | 20 Jan. | 31 Jan. |
| | 873 1 6 | | .. .. | 8 March. | 18 March. |
| | 367 0 11 | | .. .. | 5 April. | 16 April. |
| | 1,615 4 15 | | .. .. | 17 July. | 19 Aug. |
| | 5,135 13 10 | | .. .. | 4 Oct. | 17 Oct. |
| | 6,175 18 1 | | .. .. | 9 Dec. | 17 Dec. |
| | 1,109 1 13 | | .. .. | 21 Ditto. | 31 Ditto. |
| | 3,475 11 1 | | .. .. | 31 Ditto. | 11 Jan. 1817, |
| | | 19,960 0 0 | 52 12 0 | | |
| | | 4,50,607 0 0 | 835 13 0 | | |
| CARPETS. | | | | | |
| Benares, .... | 56 6 18 | | .. .. | 26 Jan. | 5 Mar. 1816. |
| | 55 6 15 | | .. .. | 30 April. | 4 June. |
| | 90 11 10 | | .. .. | 15 Aug. | 10 Sep. |
| | 35 4 0 | | .. .. | 15 Nov. | 21 Dec. |
| | | 236 0 0 | 29 3 0 | | |
| | | 4,50,843 0 0 | 864 16 0 | | |

# E 29. *a.*[1]—*(Continued.)*

| Factories. 1816. | Nett Weight as per Invoice. F. Mds. Sr. Cht. | Estimated. Tare. F. Mds. S. Chts. | Total Gross. Weight. F. Mds. Sr. Cht. | Grand Total. F. Mds. Sr. Cht. | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|---|
| RAW SILK. | | | | | | |
| Bauliah. .... | 221 8 9 | | | .. .. | 31 Jan. 1817. | 12 Feb. 1817. |
| | 402 0 0 | | | .. .. | 14 March. | 29 March. |
| | 310 0 0 | | | .. .. | 12 April. | 29 April. |
| | 183 12 0 | | | .. .. | 20 May. | 6 June. |
| | 184 28 4 | | | .. .. | 28 June. | 11 July. |
| | 276 12 0 | | | .. .. | 17 Nov. | 27 Nov. |
| | 1,577*10 13 | 167 31 5 | 1,745 †2 2 | | | |
| Commercolly. | 249 26 7 | | | .. .. | 18 Feb. | 1 March. |
| | 156 36 14 | | | .. . | 18 March. | 29 Ditto |
| | 426 25 7 | | | .. .. | 24 Oct. | 1 Nov. |
| | 64 8 12 | | | .. .. | 21 Dec. | 31 Dec. |
| | 147 5 6 | | | .. .. | 31 Ditto. | 8 Feb. 1818. |
| | 1,044 22 14 | 130 7 0 | 1,174 29 14 | | | |
| Cossimbazar. | 210 0 0 | | | .. .. | 21 Jan. | 28 Feb. 1817 |
| | 208 0 0 | | | . .. | 22 Feb. | 1 March. |
| | 150 0 0 | | | .. .. | 22 March. | 29 Ditto. |
| | 215 37 8 | | | .. .. | 29 April. | 10 May. |
| | 240 20 0 | | | .. .. | 14 June. | 23 June. |
| | 328 6 0 | | | .. .. | 3 Nov. | 11 Nov. |
| | 193 0 0 | | | .. .. | 12 Ditto. | 20 Ditto. |
| | 1,545 23 8 | 173 37 0 | 1,719 20 8 | | | |
| Hurripaul, .. | 63 37 7 | | | .. .. | 6 June. | 12 June. |
| | 92 13 12 | | | .. .. | 22 May. | 24 May |
| | 156 11 3 | 18 9 0 | 174 20 3 | | | |
| Malda, .. .. | 60 0 12 | | | .. .. | 27 Jan. | 10 Feb. |
| | 200 2 8¾ | | | .. .. | 5 May. | 23 May. |
| | 110 1 6 | | | .. .. | 30 June. | 15 July. |
| | 46 11 1 | | | .. .. | 15 Oct. | 1 Nov. |
| | 44 0 8½ | | | .. .. | 31 Dec. | 16 Jan. 1818. |
| | 460 16 4¼ | 66 16 8 | 526 32 12¼ | | | |
| Gonatia, .... | 120 0 0 | | | .. .. | 22 Jan. | 7 Feb. 1817. |
| | 130 0 0 | | | .. .. | 27 April. | 10 May. |
| | 266 0 0 | | | .. .. | 5 July. | 17 July. |
| | 200 24 12 | | | .. .. | 29 Sep. | 7 Oct. |
| | 161 39 8 | | | .. .. | 27 Dec. | 9 Jan. 1818. |
| | 50 1 0 | | | .. .. | 31 Ditto. | 15 Ditto. |
| | 928 25 4 | 153 28 0 | 1,082 13 4 | | | |
| | Carried over, | .. .. | 6,422 38 11¼ | | | |

* Qy. 20—J. M.

† Qy. 12—J. M.

# E 29. *a.*[2]

| Factories. 1817. | Nett Weight as per Invoice. F. Md. Sr. Cht. | Estimated Tons. F. Md. Sr. Cht. | Total Gross Weight. F. Md. Sr. Cht. | Grand Total. F. Md. Sr. Cht. | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|---|
| | Brought over, | .. .. | 6,422 38 11¼ | | | |
| Jungypore, .. | 60 1 15 | | | | 16 Jan. 1817. | 28 Jan. 1817. |
| | 80 2 9 | | | | 4 Feb. | 17 Feb. |
| | 60 1 13 | | | | 18 Ditto. | 28 Ditto. |
| | 60 1 14 | | | | 28 Ditto. | 13 March. |
| | 80 2 10 | | | | 21 March. | 31 Ditto. |
| | 400 11 12 | | | | 27 June. | 5 July. |
| | 232 3 6 | | | | 28 Oct. | 5 Nov. |
| | 128 3 8 | | | | 31 Dec. | 12 Jan. 1818. |
| | 1,100 29 7 | 154 27 8 | 1,255 16 15 | | | |
| Radhanagore. | 100 10 2 | | | | 1 Feb. | 10 Feb. 1817. |
| | 13 37 7 | | | | 29 Ditto. | 26 Ditto. |
| | 422 33 4 | | | | 17 Sep. | 25 Sep. |
| | 116 14 12 | | | | 24 Nov. | 1 Dec. |
| | 72 34 8 | | | | 27 Dec. | 3 Jan. 1818. |
| | *726 10 0 | 96 9 15 | 822 20 0 | | | |
| Rungpore. .. | 62 36 0 | | | | 22 March. | 3 May, 1817 |
| | 346 30 10 | | | | 27 May. | 10 July. |
| | 67 2 0 | | | | 26 Sep. | 29 Oct. |
| | 42 0 0 | | | | 30 Ditto. | 1 Nov. |
| | 54 0 1 | | | | 31 Oct. | 6 Dec. |
| | 572 28 11 | 88 8 0 | 660 36 11 | | | |
| CHASUM SILK. | | | | | | |
| Radhanagore. | 501 0 0 | 60 6 4 | 561 6 4 | 9,722 38 9¼ | 8 Sep. | 29 Sep. |
| SALT-PETRE. | | | | | | |
| Etawah and Calpie. | 9,375 0 0 | | | | 31 Dec. 1816. | 22 April, 1817 |
| | 5,625 0 0 | | | | 15 Mar. 1817. | 23 June. |
| | 750 0 0 | | | | 18 Ditto. | Ditto. |
| | 4,437 20 0 | | | | 30 May. | 12 Aug. |
| | 4,062 20 0 | | | | 7 July. | 8 Sep. |
| | 3,067 20 0 | | | | 12 Ditto. | 8 Ditto. |
| | 7,950 0 0 | | | | 3 Sep. | 8 Dec. |
| | 3,530 0 0 | | | | 10 Oct. | 9 Ditto. |
| | 2,312 20 0 | | | | 3 Dec. | 24 Feb. 1818. |
| | †41,100 0 0 | 1,849 38 0 | 42,959 38 0 | | | |
| Patna .. .. | 3,100 0 0 | | | | 22 Jan. 1817. | 18 Mar. 1817 |
| | 2,000 0 0 | | | | 30 Ditto. | 25 Ditto. |
| | 4,500 0 0 | | | | 18 March. | 14 May. |
| | 7,018 0 0 | | | | 31 Ditto. | 28 Ditto. |
| | 6,002 0 0 | | | | 30 July. | 24 Sep. |
| | 21,110 0 0 | | | | 22 Oct. | 25 Nov. |
| | 9,200 0 0 | | | | 29 Sep. | Ditto. |
| | 6,862 0 0 | | | | 4 Oct. | Ditto. |
| | 1,000 0 0 | | | | 24 Ditto. | 16 Dec. |
| | 6,986 0 0 | | | | 12 Nov. | 30 Ditto. |
| | 1,298 0 0 | | | | 30 Oct. | 1 Jan. 1818. |
| | 7,502 0 0 | | | | Ditto. | Ditto. |
| | 5,000 0 0 | | | | 6 Dec. | 23 Ditto. |
| | 5,000 0 0 | | | | 31 Ditto. | 16 March |
| | 86,578 0 0 | 2,299 18 8 | 1,08,877 18 8 | | | |
| | * Qy. 726 10 1<br>† Qy. 41,110 0 0 | Carried over, | 1,51,837 16 8 | | | |

# E 29. *a.*(2)—(*Continued.*)

| Factories. 1817. | Nett Weight as per Invoice. F. Mds. Sr. Cht. | Estimated Tons. F. Mds. Sr. Cht. | Total Gross Weight F. Mds. Sr. Cht. | Grand Total. F. Mds. Sr. Cht. | Date of Dispatch | Date of Receipt. |
|---|---|---|---|---|---|---|
| | Brought over, | | 1,51,837 16 8 | | | |
| Behar. .. .. | 60 0 0 | | | | 8 Dec. | 30 Dec. 1817. |
| | 1,593 33 0 | | | | 31 Ditto. | 6 Feb. 1818. |
| | 1,653 33 0 | 36 36 0 | 1,690 29 0 | 1,53,528 5 8 | | |
| SUGAR. | | | | | | |
| Benares. .. .. | 4,920 20 0 | | | | 7 June 1817. | 4 Aug. 1817. |
| | 7,032 11 0 | | | | 1 July. | 13 Ditto. |
| | 10,295 0 0 | | | | 20 June. | 29 Ditto. |
| | 2,519 36 0 | | | | 4 Aug. | 10 Sep. |
| | 4,827 37 0 | | | | 2 Ditto. | 16 Ditto. |
| | 581 20 0 | | | | 27 Ditto. | 2 Oct. |
| | 30,177 12* 0 | 782 27 14 | 30,959 39† 14 | 30,959 39†† 14 | | |
| COTTON. | | | | | | |
| Etawah and Calpie. | 4,057 15 6 | | | | 15 Dec. 1816. | 6 June 1817. |
| | 11,571 20 0 | | | | 24 Nov. 1817. | 6 July, 1818. |
| | 7,304 26 4 | | | | 30 Dec. | Ditto. |
| | 3,783 0 0 | | | | 31 Ditto. | Ditto. |
| | 26,716 21 10 | 1,749 28 12 | 28,466 10 6 | 28,466 10 6 | | |
| | | | —— | 2,22,677 14 5¼ | | |
| | * Qy. 4—J. M. | | † Qy. 31—J. M. | †† Qy. 31—J. M. | | |

# E 29. *a.*[(2)]—*(Continued.)*

| Factories. 1817. | Quantity, Pieces, and Tonnage as per Invoice. | | | Pieces and Tonnage. | Total pieces and Tonnage Tons Cwt. | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|---|---|
| PIECE GOODS. | | | | | | | |
| Benares. .... | 2,241 | 5 | 7 | | | 5 Feb. 1817. | 13 Mar. 1817. |
| | 1,900 | 4 | 15 | | | 25 July. | 28 Aug. |
| | 8,186 | 17 | 4 | | | 20 Oct. | 13 Nov. |
| | 10,019 | 24 | 2 | | | 15 Nov. | 17 Dec. |
| | 9,046 | 21 | 17 | | | 18 Dec. | 20 Jan. 1818. |
| | | | | 31,392 0 0 | 73 5 0 | | |
| Chittagong. ... | 22,500 | 47 | 8 | | | 11 Jan. 1817. | 12 Feb. 1817. |
| | 10,245 | 22 | 12 | | | 21 Feb. | 3 April. |
| | 35,540 | 69 | 3 | | | 6 Dec. | 13 Jan. 1818. |
| | | | | 68,285 0 0 | 139 3 0 | | |
| Cossimbazar. .. | 5,626 | 6 | 11 | | | 8 Feb. 1817. | 17 Feb. 1817. |
| | 6,112 | 5 | 10 | | | 31 March. | 7 April. |
| | 2,012 | 1 | 15 | | | 29 April. | 10 May |
| | 5,051 | 4 | 10 | | | 30 Ditto. | 13 Ditto. |
| | 16,000 | 15 | 0 | | | 29 Nov. | 13 Dec. |
| | 6,000 | 5 | 11 | | | 31 Dec. | 10 Jan. 1818. |
| | | | | 40,801 0 0 | 38 17 0 | | |
| Dacca. ........ | 1,894 | 4 | 14 | | | 16 Jan. | 28 Ditto, 1817. |
| | 2,914 | 7 | 5 | | | 24 Dec. | 3 Ditto, 1818. |
| | | | | 4,808 0 0 | 11 19 0 | | |
| Golagore & Bainagore. | 7,000 | 13 | 7 | | | 2 Feb. | 11 Feb. 1817. |
| | 11,157 | 20 | 11 | | | 10 May. | 19 May. |
| | 3,678½ | 6 | 19 | | | 31 Ditto. | 3 June. |
| | 24,170 | 48 | 12 | | | 10 Dec. | 13 Dec. |
| | 5,346 | 10 | 7 | | | 22 Ditto. | 23 Ditto. |
| | | | | 51,351½ 0 0 | 99 16 0 | | |
| Hurriaul....... | 1,015 | 2 | 7 | | | 1 Feb. | 17 Feb. |
| | 732 | 1 | 11 | | | 18 Ditto. | 6 March. |
| | 3,100 | 7 | 8 | | | 17 Dec. | 5 Jan. 1818. |
| | | | | 4,847 0 0 | 11 6 0 | | |
| Keerpoy. ...... | 1,857 | 4 | 12 | | | 30 Dec. | 2 Jan. |
| | | | | 1,857 0 0 | 4 12 0 | | |
| Mednapore. ... | 3,794 | 9 | 9 | | | 26 Ditto. | 31 Dec. 1817. |
| | | | | 3,794 0 0 | 9 9 0 | | |
| Hurripaul. ... | 3,036 | 5 | 7 | | | 22 May, 1817. | 24 May, 1817. |
| | 10,490 | 20 | 0 | | | 12 Nov. | 17 Nov. |
| | 3,678 | 7 | 2 | | | 30 Dec. | 2 Jan. 1818. |
| | | | | 17,204 0 0 | 32 19 0 | | |
| Luckipore. ... | 13,803 | 30 | 11 | | | 15 Jan. | 21 Feb. 1817. |
| | 24,540 | 49 | 10 | | | 10 Sept. | 13 Oct. |
| | 16,520 | 35 | 2 | | | 22 Oct. | 18 Nov. |
| | 33,140 | 68 | 2 | | | 26 Dec. | 22 Jan. 1818. |
| | | | | *84,523 0 0 | 183 5 0 | | |
| Malda. ... ... | 169 | 0 | 4 | | | 7 March. | 24 Mar. 1817. |
| | 1,475 | 1 | 16 | | | 15 Oct. | 1 Nov. |
| | 104 | 0 | 2 | | | 31 Dec. | 16 Jan. 1818. |
| | | | | 1,748 0 0 | 2 2 0 | | |
| | Carried over, | | | 3,10,610½ 0 0 | 606 13 0 | | |

* Qv. 88003 0 0
J. M.

# E 29. *a.*[2]—*(Continued.)*

| Factories. 1817. | Quantity, Pieces, and Tonnage as per Invoice. | Pieces and Tonnage. | Total Pieces and Tonnage. Tons. Cwt. | | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|---|
| | Brought over, | 3,10,610½ 0 0 | 606 13 0 | | | |
| Rungpore, ... | 8,052 16 11 | | | ... .. | 26 Sept. | 1 Nov. 1817. |
| | 2,130 3 13 | | | ... .. | 22 Nov. | 22 Dec. |
| | | 10,182 0 0 | 20 4 0 | | | |
| Patna, ....... | 5,000 10 0 | | | ... ... | 10 Jan. 1817. | 11 Feb. |
| | 5,370 11 0 | | | ... .. | 13 Feb. | 17 March. |
| | 10,000 20 0 | | | ... ... | 23 June. | 21 July. |
| | 5,000 10 0 | | | ... ... | 29 Aug. | 22 Sept. |
| | 6,000 12 0 | | | ... ... | 30 Sept. | 25 Oct. |
| | 5,000 10 0 | | | ... ... | 31 Oct. | 25 Nov. |
| | 7,000 14 0 | | | ... .. | 29 Nov. | 31 Dec. |
| | 7,000 14 0 | | | ... ... | 31 Dec. | 31 Aug. |
| | | 50,370 0 0 | 101 0 0 | | | |
| Santipore, ..... | 535 1 6 | | | ... ... | 25 Jan. 1817. | 29 Jan. 1817. |
| | 1,000 2 10 | | | ... ... | 13 Nov. | 17 Nov. |
| | 922 2 6 | | | ... ... | 29 Dec. | 31 Dec. |
| | | 2,457 0 0 | 6 2 0 | | | |
| Burron, ..... | 3,331 7 11 | | | ... ... | 25 Jan. | 29 Jan. |
| | 590 1 17 | | | ... ... | 3 Feb. | 6 Feb. |
| | 1,303 3 0 | | | ... ... | 14 March. | 20 March. |
| | 4,253 9 7 | | | ... ... | 13 Nov. | 17 Nov. |
| | 1,703 4 6 | | | ... ... | 29 Dec. | 31 Dec. |
| | 1,025 2 10 | | | ... ... | 31 Ditto. | 2 Jan. 1818. |
| | | 12,205 0 0 | 28 11 0 | | | |
| Soonamooky,.. | 523 0 15 | | | .. ... | 20 Jan. | 29 Jan. 1817. |
| | 390 0 11 | | | ... ... | 28 April. | 30 April. |
| | 3,455 10 4 | | | ... .. | 4 July. | 18 July. |
| | 6,900 19 4 | | | ... ... | 29 Sept. | 8 Oct. |
| | 3,500 8 15 | | | ... ... | 20 Dec. | 1 Jan. 1818. |
| | 1,400 4 12 | | | ... ... | 30 Ditto. | 12 Ditto. |
| | 1,497 4 14 | | | .. ... | 31 Ditto. | 12 Ditto. |
| | 873 1 6 | | | ... ... | ,, Ditto. | 28 Ditto. |
| | | 18,538 0 0 | 50 1 0 | | | |
| | | 4,04,362½ 0 0 | 812 11 0 | | | |
| CARPET. | | | | | | |
| Benares, ...... | 19 2 8 | | | | | |
| | 176 8 0 | | | | | |
| | | 195 0 0 | 10 8 0 | ... ... | 25 July. | 28 Aug. 1817. |
| Total Pieces and Tons. | | 4,04,557½ 0 0 | 822 19 0 | ... ... | 24 Dec. | 15 Jan. 1818. |

# E 29. *a.*[3]

| Factories. 1818. | Nett Weights as per Invoice. F. Mds. Sr. Cht. | Estimated Tare. F. Mds. Sr. Cht. | Total Gross Weight. F. Mds. Sr. Cht. | Grand Total. F. Md. Sr. Cht. | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|---|
| **Raw Silk.** | | | | | | |
| Bauleah, ...... | 178 36 0 | | | .. .. | 5 Jan. 1818. | 16 Jan. 1818. |
| | 200 0 0 | | | .. .. | 27 Ditto. | 6 Feb. |
| | 300 0 0 | | | .. .. | 18 Feb. | 2 March. |
| | 50 0 0 | | | .. .. | 27 Ditto. | 7 Ditto. |
| | 260 0 0 | | | .. .. | 18 April. | 1 May. |
| | 395 31 0 | | | .. .. | 11 July. | 22 July. |
| | 278 16 10 | | | .. .. | 5 Nov. | 20 Nov. |
| | 1,663 3 10 | 163 21 0 | 1,826 24 10 | | | |
| Commercolly. | 50 3 2 | | | .. .. | 13 Feb. | 23 Feb. |
| | 61 17 0 | | | .. .. | 28 Ditto. | 13 March. |
| | 35 24 14 | | | .. .. | 15 March. | 26 Ditto. |
| | 348 19 0 | | | .. .. | 29 Aug. | 5 Sept. |
| | 27 22 14 | | | .. .. | 29 Nov. | 4 Dec. |
| | 12 37 14 | | | .. .. | 7 Dec. | 14 Ditto. |
| | 65 20 6 | | | .. .. | 31 Ditto. | 27 Jan. 1819. |
| | 601 25 2 | 80 18 8 | 682 3 10 | | | |
| Cossimbazar. | 300 0 0 | | | .. .. | 20 Jan. | 28 Jan. 1818. |
| | 300 0 0 | | | .. .. | 14 Feb. | 23 Feb. |
| | 223 30 0 | | | .. .. | 21 March. | 30 March. |
| | 370 27 12 | | | .. .. | 30 June. | 10 July. |
| | 1,194 17 12 | 134 31 0 | 1,329 8 12 | | | |
| Hurripaul, ... | 26 19 0 | | | .. .. | 24 Feb. | 26 Feb. |
| | 47 6 10 | | | .. . | 28 May. | 30 May. |
| | 58 19 12 | | | .. .. | 4 June. | 8 June. |
| | 23 19 9 | | | .. .. | 25 Ditto. | 27 Ditto. |
| | 100 2 12 | | | .. .. | 15 Dec. | 18 Dec. |
| | 50 1 10 | | | .. .. | 24 Ditto. | 28 Ditto. |
| | 305 29 5 | 34 26 0 | 340 15 5 | | | |
| Gonatia, ...... | 100 2 8 | | | .. .. | 17 Jan. | 29 Jan. |
| | 100 2 7 | | | .. .. | 4 Feb. | 16 Feb. |
| | 58 1 6 | | | .. .. | 10 March | 25 March. |
| | 428 9 13 | | | .. .. | 7 July. | 16 July. |
| | 170 2 12 | | | .. .. | 7 Sept. | 18 Sept. |
| | 74 3 2 | | | .. .. | 30 Ditto. | 12 Oct. |
| | 110 3 9 | | | .. .. | 31 Dec. | 15 Jan. 1819. |
| | 1,040 25 9 | 172 10 0 | 1,212 35 9 | | | |
| Jungypore, ... | 80 2 5 | | | .. .. | 19 Jan. 1818. | 28 Jan. 1818. |
| | 80 2 5 | | | .. .. | 7 Feb. | 16 Feb. |
| | 122 3 9 | | | .. .. | 28 Ditto. | 21 April. |
| | 480 14 4 | | | .. .. | 14 July. | 22 July. |
| | 140 1 11 | | | .. .. | 31 Ditto. | 8 Aug. |
| | 160 1 13 | | | .. .. | 18 Sept. | 24 Sept. |
| | 114 34 [illegible] | | | .. ... | 9 Dec. | 17 Dec. |
| | 40 0 7 | | | .. .. | 21 Ditto. | 31 Ditto. |
| | 1,217 21 5 | 171 11 4 | 1,388 32 5 | | | |
| | Carried over, | 756 37 12 | 6,780 2 3 | | | |

# E 29. *a.*[3]—*(Continued.)*

| Factories 1818. | Nett Weight as per Invoice. F. Mds. Sr. Cht. | Estimated Tare. F. Mds. Sr. Cht. | Total Gross Weight. F. Mds. Sr. Cht. | Grand Total. F. Mds. Sr. Cht. | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|---|
| | Brought over, | 756 37 12 | 6,780 2 3 | | | |
| Malda, ... ... | 70 0 14 | | | | 31 Jan. | 14 Feb. 1818. |
| | 60 0 12 | | | | 24 Feb. | 10 Mar. |
| | 130 1 10 | | | | 21 April. | 7 May. |
| | 100 1 4¾ | | | | 5 June. | 26 June. |
| | 150 1 13¼ | | | | 17 Aug. | 28 Aug. |
| | 32 0 6¼ | | | | 25 Nov. | 12 Dec. |
| | 542 6 12¼ | 77 36 8 | 620 3 4¼ | | | |
| Radnagore. ... | 80 35 4 | | | | 27 Jan. | 2 Feb. |
| | 41 39 12 | | | | 21 Feb. | 28 Ditto |
| | 479 34 10 | | | | 19 Sept. | 26 Sept. |
| | 261 9 14 | | | | 13 Nov. | 19 Nov. |
| | 89 4 4 | | | | 2 Dec. | 7 Dec. |
| | 58 21 8 | | | | 28 Ditto | 24 Ditto. |
| | 1,011 25 4 | 130 16 12 | 1,142 2 0 | | | |
| Rungpore, ... | 108 0 0 | | | | 1 Jan. | 31 Jan. |
| | 73 29 6 | | | | Ditto. | 7 Feb. |
| | 110 3 12 | | | | 3 Feb. | 12 March. |
| | 99 0 0 | | | | 31 March. | 25 May. |
| | 140 7 0 | | | | 24 July. | 17 Aug. |
| | 131 23 9 | | | | Ditto. | 18 Sept. |
| | 140 5 2 | | | | 25 Nov. | 19 Dec. |
| | 13 14 0 | | | | Ditto. | 28 Ditto |
| | 816 2 13 | 124 32 0 | 940 34 13 | | | |
| | | | | 9,483 0 4¼ | | |
| SALTPETRE. | | | | | | |
| Etawah, & Calpie, ...... | 4,800 0 0 | | | | 4 Feb. 1818. | 8 May, 1818. |
| | 5,850 0 0 | | | | 23 April | 22 Aug. |
| | 5,662 20 0 | | | | 26 May. | Ditto. |
| | 4,342 20 0 | | | | 6 June. | 29 Aug. |
| | 5,217 20 0 | | | | 22 July. | 18 Sept. |
| | 4,840 0 0 | | | | 10 Aug. | 28 Oct. |
| | 2,375 0 0 | | | | 29 Ditto. | 10 Nov. |
| | 1,437 20 0 | | | | 26 Oct. | 15 Feb. 1819. |
| | 812 20 0 | | | | 16 Dec. | 16 Ditto. |
| | 3,625 0 0 | | | | 3 Nov. | 28 April. |
| | 7,305 0 0 | | | | 19 Dec. | 12 June. |
| | 46,267 20 0 | 2,082 1 8 | 48,349 21 8 | | | |
| Patna, ......... | 11,000 0 0 | | | | 28 Feb. | 27 April, 1818 |
| | 7,182 0 0 | | | | 31 July. | 15 Sept. |
| | 4,240 0 0 | | | | 26 Aug. | 2 Ditto. |
| | 7,460 0 0 | | | | 27 Ditto. | 21 Ditto. |
| | 10,238 0 0 | | | | 2 Oct. | 21 Nov. |
| | 8,966 0 0 | | | | 14 Sept. | 26 Oct. |
| | 8,200 0 0 | | | | 30 Ditto. | 5 Nov. |
| | 16,760 0 0 | | | | 29 Oct. | 28 Dec. |
| | 8,000 0 0 | | | | 8 Dec. | 17 Feb. 1819 |
| | 11,330 0 0 | | | | 26 Ditto. | 12 April. |
| | 3,300 0 0 | | | | 31 Ditto. | 20 March. |
| | 96,676 0 0 | 2,567 38 4 | 99,243 38 4 | | | |
| | Carried over, .. | .. .. | 1,47,593 19 12 | 9,483 0 4¼ | | |

## E 29. a.(3)—(Continued.)

| Factories. 1818. | Net Weight as per Invoice. F. Mds. Sr. Cht. | Estimated Tare. Fy. Mds. Sr. Cht. | Total Gross Weight. F. Mds. Sr. Cht. | Grand Total. F. Mds. Sr. Cht. | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|---|
| | Brought over, .. | .. | 1,47,593 19 12 | 9,483 0 4¼ | | |
| Behar, ......... | 1,670 28 0 | | | | 8 Jan. 1818. | 7 Mar. 1818. |
| | 4,362 32 0 | | | | 20 Ditto. | 20 Ditto. |
| | 1,787 26 0 | | | | 1 Feb. | 2 April. |
| | *1,821 6 0 | 150 19 8 | 7,971 25 8 | 1,55,565 5 4 | | |
| SUGAR. | | | | | | |
| Benares, .. ... | 4,943 30 0 | | | | 7 May. | 29 June. |
| | 7,063 24 0 | | | | 25 Ditto. | 16 July. |
| | 5,638 14 0 | | | | 12 June. | 24 Ditto. |
| | 2,813 39 8 | | | | 11 July. | 22 Aug. |
| | 4,558 23 8 | | | | 25 June. | Ditto. |
| | 2,309 32 8 | | | | 30 July. | 3 Sept. |
| | 5,268 25 0 | | | | 6 Aug. | 26 Ditto. |
| | 32,596 28 8 | 849 12 3 | 33,446 0 11 | 33,446 0 11 | | |
| COTTON. | | | | | | |
| Etawah, & Calpie,...... | 15,585 9 4 | | | | 29 Oct. | 7 July, 1819. |
| | 15033 15 7 | | | | 20 Nov. | 27 Ditto. |
| | 40 0 0 | | | | 20 Ditto. | 23 April. |
| | 30,658 24 11 | 1,724 25 0 | 32,383 9 11 | 32,383 9 11 | | |
| | | | | 2,30,877 15 14¾ | | |

* Qy. 7,821 6 0
J M

2 h

# E 29. a.(3)—(Continued.)

| Factories 1818. | Quantity, Pieces, and Tonnage as per Invoice. | Pieces & Tonnage. | Total Pieces and Tonnage. | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|
| PIECE GOODS. | | | | | |
| | Pieces ton. cwt | | | | |
| Benares, .... | 3,267 6 12 | | .. .. | 7 Feb. 1818. | 12 Mar. 1818. |
| | 3,250 6 8 | | .. .. | 21 July. | 11 Aug. |
| | 1,840 3 13 | | .. .. | 19 Oct | 17 Nov. |
| | 10,209 22 9 | | .. .. | 26 Nov. | 17 Dec. |
| | 5,367 12 4 | P.Tons.Cwt. | .. .. | 21 Dec. | 11 Feb. 1819. |
| | | *23,883 51 6 | | | |
| Chittagong, .. | 26 340 55 19 | | .. .. | 21 Jan. | 27 Feb. 1818. |
| | 15,180 29 7 | | .. .. | 28 Feb. | 16 April. |
| | 28,180 64 14 | | | 1 Dec. | 2 Jan. 1819. |
| | | 69,700 150 0 | | | |
| Cossimbazar, | 5,000 4 11 | | .. .. | 20 March. | 26 March. |
| | 10,000 9 7 | | .. .. | 1 Dec. | 23 Dec. |
| | | 15,000 13 18 | | | |
| Dacca, .. .. | 1,509 3 1 | | | 12 Jan. | 21 Jan. |
| | 938 2 7 | | | 5 Nov. | 27 Nov. |
| | | 2,447 5 8 | | | |
| Golagore & Barnagore, | 12,085 25 0 | | .. .. | 27 Feb. 1818. | 9 Mar. 1818. |
| | 729 1 4 | | .. .. | 6 March. | Ditto. |
| | 3,357 7 1 | | .. .. | 26 Ditto. | 2 April. |
| | 2,788 5 15 | | .. .. | 30 March. | 6 Ditto. |
| | 6,060 13 10 | | .. .. | 30 May. | 6 June. |
| | 880 1 17 | | .. .. | 5 Aug. | 7 Aug. |
| | 4,750 10 0 | | .. .. | 24 Ditto. | 5 Sep. |
| | 8,050 16 15 | | .. .. | 4 Dec. | 7 Dec. |
| | 3,504 6 8 | | .. .. | 15 Ditto. | 19 Ditto. |
| | 5,005 9 14 | | .. .. | 30 Ditto. | 2 Jan. 1819. |
| | | †46,208 97 4 | | | |
| Hurriaul, .. | 1,064 2 8 | | .. .. | 17 Feb. | 3 Mar. 1818. |
| | 1,315 3 15 | | .. .. | 28 Dec. | 12 Jan. 1819. |
| | | 2,379 6 3 | | | |
| Keerpoy, .... | 1,702 4 5 | | .. .. | 10 Dec. | 18 Dec. 1818. |
| | | 1,702 4 5 | | | |
| Midnapore, .. | 3,932 9 16 | | .. .. | 10 Dec. | 18 Ditto. |
| | | 3,932 9 16 | | | |
| Hurripaul, .. | 3,500 6 8 | | .. .. | 6 March. | 19 March. |
| | 1,084 2 1 | | .. .. | 28 Ditto. | 6 April. |
| | 6,350 12 6 | | .. .. | 15 Nov. | 17 Nov. |
| | 3,090 6 1 | | .. .. | 28 Dec. | 1 Jan. 1819. |
| | | 14,024 26 16 | | | |
| Luckipore, .. | 43,560 92 10 | | .. .. | 25 Feb. 1818. | 21 Mar. 1818. |
| | 25,920 57 0 | | .. .. | 17 April. | 18 May. |
| | 32,160 72 1 | | .. .. | 2 Oct. | 6 Nov. |
| | 15,940 35 17 | | .. .. | 12 Dec. | 2 Jan. 1819. |
| | | 1,17,580 257 8 | | | |
| Malda, .. .. | 804 1 0 | | .. .. | 24 Feb. | 10 Mar. 1818. |
| | 1,340 1 13 | | .. .. | 17 Aug. | 28 Aug. |
| | 467 0 11 | | .. .. | 25 Nov. | 12 Dec. |
| | | 2,611 3 4 | | | |
| | Carried over, | 2,99,466 625 8 | | | |
| | | * Qy. 23,893 51 6 | | | |
| | | † Qy. 47,208 97 4 | | | |

# E 29. *a.*[3]—(*Continued.*)

| Factories 1819. | Quantity Pieces and Tonnage as per Invoice.* | Pieces and Tonnage. | Total Pieces and Tonnage. | | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|---|
| | Brought over, | 2,99,466 625 8 | | | | |
| Rungpore, .. | 4,295 7 8 | | | .. .. | 1 Jan. | 7 Feb. |
| | 2,495 4 12 | | | .. .. | 18 Feb. | 21 April. |
| | 2,830 3 15 | | | .. .. | 31 March. | 25 May. |
| | 2,610 2 15 | | | .. .. | 24 July. | 17 Aug. |
| | 3,850 6 0 | | | .. .. | 22 Oct. | 10 Dec |
| | 2,000 3 12 | | | .. .. | 25 Nov. | 19 Dec. |
| | | *18,035 28 2 | | | | |
| Patna, .. .. | 5,000 10 0 | | | .. .. | 31 Jan. | 27 Feb. |
| | 8,074 16 0 | | | .. .. | 28 Feb. | 31 March. |
| | 12,500 24 0 | | | .. .. | 29 June. | 21 July. |
| | 5,000 10 0 | | | .. .. | 31 Aug. | 22 Sept. |
| | 4,000 8 0 | | | .. .. | 19 Nov. | 17 Dec. |
| | 5,100 10 0 | | | .. .. | 19 Dec. | 19 Jan. 1819. |
| | | 39,674 78 0 | | | | |
| Burron, .. .. | 1,040 2 9 | | | .. .. | 2 Feb. 1818. | 4 Feb. 1818. |
| | 1,040 2 10 | | | .. .. | 4 March. | 7 March. |
| | | 2,080 4 19 | | | | |
| Soonamooky, .. | 1,790 4 18 | | | .. .. | 20 Feb. | 3 March. |
| | 648 0 19 | | | .. .. | 26 Feb. | 21 Ditto. |
| | 1,290 3 12 | | | .. .. | 14 Aug. | 26 Augt. |
| | 3,360 8 8 | | | .. .. | 23 Sep. | 17 Oct. |
| | 3,960 10 16 | | | .. .. | 22 Dec. | 2 Jan. 1819. |
| | | 11,048 28 13 | | | | |
| | | | 3,70,303 765 2 | | | |
| CARPET. | | | | | | |
| Benares, .... | 55 6 15 | | | .. .. | 7 Feb. 1818 | 12 Mar. 1818. |
| | 174 8 0 | | | .. .. | 21 July. | 11 Aug. |
| | 28 3 7 | | | .. .. | 29 Oct. | 17 Nov. |
| | | | 257 18 2 | | | |
| GUNIES. | | | | | | |
| Malda, .. .. | 7,800 6 9 | | 7,800 6 9 | .. .. | 6 Nov. | 26 Nov. |
| | | * Qy. 18,080 28 2 J. M | 3,78,360 789 13 | | | |

# E 29. a.(4)

| Factories 1819. | Net Weight as per Invoice. Fy. Mds. Sr. Cht. | Estimated Tare. Fy. Mds. Sr. Cht. | Total Gross Weight. Fy. Mds. Sr. Cht. | Grand Total. Fy. Mds. Sr. Cht. | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|---|
| RAW SILK. | | | | | | |
| Bauleah, .... | 254 37 12 | | | .. .. | 21 Jan. 1819 | 4 Feb. 1819 |
| | 350 0 0 | | | .. .. | 20 Feb. | 6 March. |
| | 100 0 0 | | | .. .. | 27 Ditto. | 26 Ditto. |
| | 518 8 8¾ | | | .. .. | 28 June. | 10 July. |
| | 302 6 10¼ | | | .. .. | 4 Sept. | 13 Sept. |
| | 187 33 11 | | | .. .. | 20 Nov. | 30 Nov. |
| | 1,713 6 10 | 169 5 12 | 1,882 12 6 | | | |
| Commercolly, | 36 2 4 | | | .. .. | 6 Feb. | 15 Feb. |
| | 40 2 8 | | | .. .. | 10 Ditto. | 24 Ditto. |
| | 40 2 8 | | | .. .. | 16 Ditto. | 27 Ditto |
| | 40 2 8 | | | .. .. | 23 Ditto. | 5 March. |
| | 45 27 2 | | | .. .. | 1 March. | 15 Ditto. |
| | 86 33 0 | | | .. .. | 21 Ditto. | 12 April. |
| | 192 18 6 | | | .. .. | 7 Aug. | 16 Aug. |
| | 44 2 1 | | | .. .. | 24 Sept. | 4 Oct. |
| | 30 24 5 | | | .. .. | 22 Oct. | 30 Ditto. |
| | 24 27 2 | | | .. .. | 12 Nov. | 25 Nov. |
| | 34 1 5 | | | .. .. | 8 Dec. | 22 Dec. |
| | 47 31 9 | | | .. .. | 31 Ditto. | 25 Jan. 1820. |
| | 662 14 10 | 89 18 4 | 751 32 14 | | | |
| Cossimbazar, | 250 0 0 | | | .. .. | 23 Jan. | 11 Feb. 1819. |
| | 200 0 0 | | | .. .. | 22 Feb. | 2 March. |
| | 90 32 0 | | | .. .. | 20 March. | 31 Ditto. |
| | 144 0 0 | | | .. .. | 3 July. | 13 July. |
| | 338 0 0 | | | .. ... | 28 Ditto. | 6 Aug. |
| | 247 20 0 | | | .. .. | 28 Aug. | 3 Sept. |
| | 300 0 0 | | | .. .. | 9 Oct. | 14 Oct. |
| | 280 0 0 | | | .. .. | 17 Nov. | 24 Nov. |
| | 431 36 10 | | | .. .. | 28 Dec. | 8 Jan. 1820. |
| | 2,282 8 10 | 235 5 2 | 2,517 13 12 | | | |
| Hurripaul, .. | 81 17 12 | | | .. .. | 5 Feb. 1819. | 10 Feb. 1819. |
| | 164 14 0 | | | .. .. | 29 June. | 3 July. |
| | 30 33 8 | | | .. .. | 3 July, | 7 Ditto. |
| | 146 6 0 | | | .. .. | 10 Nov. | 19 Nov. |
| | 88 3 0 | | | .. .. | 13 Ditto. | 16 Ditto. |
| | 68 3 0 | | | .. .. | 13 Ditto. | 16 Ditto. |
| | 24 2 8 | | | .. .. | 29 Dec. | 31 Dec. |
| | 24 2 4 | | | .. .. | 31 Ditto. | 8 Jan. 1820. |
| | 40 0 1 | | | .. .. | Ditto. | 14 Ditto. |
| | 24 0 0 | | | .. .. | Ditto. | 24 Ditto. |
| | 691 2 1 | 77 25 0 | 768 27 1 | | | |
| Gonatea, .... | 100 3 7 | | | .. .. | 23 Jan. | 5 Feb. 1819 |
| | 142 4 15 | | | .. .. | 22 Mar. | 1 April. |
| | 144 1 12 | | | .. .. | 26 July. | 3 Sep. |
| | 470 17 3 | | | .. .. | 20 Sept. | 11 Oct. |
| | 120 3 11 | | | .. .. | 30 Dec. | 15 Jan. 20. |
| | 50 1 12 | | | .. .. | 31 Ditto | 24 Ditto. |
| | 1,026 32 12 | 169 37 4 | 1,196 30 0 | | | |
| | Carried over, | .. .. | 7,116 36 1 | | | |

# E 29. *a.*[4]—*(Continued.)*

| Factories. 1819. | Net Weight as per Invoice. F. Mds. Sr. Cht. | Estimated. Tare. F. Mds. Sr. Cht. | Total Gross Weight. F. Mds. Sr. Cht. | Grand Total. F. Mds. Sr. Cht. | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|---|
| | Brought over, | ... ... | 7,116 36 1 | | | |
| Jungypore. .. | 148 4 6 | | | | 21 Jan. | 1 Feb. 1819. |
| | 221 11 9 | | | | 20 Feb. | 15 March. |
| | 340 11 0 | | | | 4 July. | 13 July. |
| | 162 1 14 | | | | 31 Dec. | 9 Aug. |
| | 142 2 12 | | | | 9 Sept. | 17 Sept. |
| | 216 2 9 | | | | 5 Nov. | 13 Nov. |
| | 182 2 0 | | | | 30 Ditto | 10 Dec. |
| | 1,411 36 2 | 198 22 8 | *1,610 18 2 | | | |
| Malda. .. .. | 40 0 7½ | | | | 23 Jan. 1819. | 16 Feb. 1819. |
| | 350 3 13 | | | | 3 July. | 23 July. |
| | 2 0 0 | | | | Ditto | Ditto. |
| | 119 9 4 | | | | 23 Oct. | 5 Nov. |
| | 511 13 8½ | 73 35 8 | 585 9 0½ | | | |
| Radnagore. .. | 65 1 0 | | | | 25 Jan | 1 Feb. |
| | 20 31 10 | | | | 20 Feb. | 1 March. |
| | 600 7 0 | | | | 7 Sept. | 16 Sept. |
| | 411 31 12 | | | | 4 Nov. | 10 Nov. |
| | 247 31 4 | | | | 16 Dec. | 23 Dec. |
| | 1,345 22 10 | 169 6 6 | 1,514 29 0 | | | |
| Rungpore, .. | 50 0 0 | | | | 15 Jan. | 6 Feb. |
| | 130 0 4 | | | | 6 Feb. | 15 Ditto. |
| | 20 0 0 | | | | Ditto. | 27 Ditto. |
| | 154 28 12 | | | | 28 Ditto. | 26 April. |
| | 289 10 9 | | | | 10 Sept | 12 Oct. |
| | 44 0 0 | | | | 18 Dec. | 29 Dec. |
| | 65 15 9 | | | | Ditto | 10 Jan. 1820. |
| | 753 15 2 | 115 8 0 | 868 23 2 | | | |
| | | | | 11,695 35 5½ | | |
| SALTPETRE. | | | | | | |
| Etawah and Calpee..... | 5,815 0 0 | | | | 9 Jan. | 11 June. 1819. |
| | 500 0 0 | | | | 19 April. | 30 Ditto |
| | 6,742 20 0 | | | | 20 Feb. | 11 Aug. |
| | 1,875 0 0 | | | | 8 April. | 11 Ditto. |
| | 970 0 0 | | | | 2 March. | Ditto. |
| | 8,287 20 0 | | | | 4 May. | 24 Ditto. |
| | 642 20 0 | | | | 27 Ditto. | 1 Sept. |
| | 7,000 0 0 | | | | 26 Ditto. | 10 Ditto. |
| | 6,562 20 0 | | | | 15 June. | 18 Ditto. |
| | 6,275 0 0 | | | | 22 July. | 20 Ditto. |
| | 7,505 0 0 | | | | 10 Ditto. | 14 Oct. |
| | 6,095 0 0 | | | | 25 Aug. | 16 Nov. |
| | 2,280 0 0 | | | | 1 Nov. | 25 Jan. 1820. |
| | 1,730 0 0 | | | | 29 Oct. | 22 Feb. |
| | 2,940 0 0 | | | | 13 Nov. | 25 Ditto. |
| | 2,362 20 0 | | | | 1 Dec. | 6 March |
| | 67,582 20 0 | 3,041 13 0 | 70,623 33 0 | | | |
| | Carried over, | . .. .. | 70,623 33 0 | 11,695 35 5½ | | |

* Qy. 1,610 18 10
J. M.

# E 29. a.[4]—(Continued.)

| Factories. 1819. | Net Weight as per Invoice. F. Mds. Sr. Cht. | Estimated Tons. F. Mds. Sr. Cht. | Total Gross Weight. F. Mds. Sr. Cht. | Grand Total. F. Mds. Sr. Cht. | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|---|
| | Brought over, | .. .. .. | 70,623 33 0 | 11,695 35 5½ | | |
| Patna. .. .. | 7,358 0 0 | | | | 1 Feb. 1819. | 11 May, 1819. |
| | 2,864 0 0 | | | | 3 Ditto. | 21 April. |
| | 6,050 0 0 | | | | 27 Ditto. | 11 May. |
| | 1,000 0 0 | | | | 3 Aug. | 30 Sept. |
| | 10,170 0 0 | | | | 31 Ditto. | 21 Oct. |
| | 22,0 0 0 0 | | | | 3 Ditto. | 11 Ditto. |
| | 13,252 0 0 | | | | 10 Sept. | 9 Nov. |
| | 16,426 0 0 | | | | 21 Ditto. | 23 Ditto. |
| | 3,860 0 0 | | | | 30 Ditto | 2 Ditto. |
| | 13.950 0 0 | | | | 20 Oct. | 16 Dec. |
| | 14,050 0 0 | | | | 26 Ditto | 28 Ditto. |
| | 12,124 0 0 | | | | 22 Ditto | 30 Nov |
| | 9,408 0 0 | | | | 23 Nov | 31 Jan. 1820 |
| | 8,030 0 0 | | | | 8 Dec. | 3 Feb. |
| | 1,40,542 0 0 | 3,733 5 14 | 1,44,275 5 14 | 2,14,898 38 14 | | |
| **Sugar.** | | | | | | |
| **Benares,** .. .. | 12,673 4 8 | | | | 12 July. | 30 Aug. 1819. |
| | 9,810 16 8 | | | | 23 Ditto. | 11 Sept. |
| | 8,004 34 0 | | | | 6 Aug. | 20 Ditto. |
| | *30,496 25 0 | 795 30 12 | 31,292 5 12 | 31,292 5 12 | | |
| **Cotton.** | | | | | | |
| **Etawah and Calpee.....** | 12,146 4 8 | | | | 22 Sep. | 22 Nov. |
| | 10,579 15 4 | | | | 22 May. | 11 Oct. |
| | 11,234 13 0 | | | | 4 June. | 25 Nov. |
| | 1,590 1 4 | | | | 16 Ditto. | 23 Sept. |
| | 1,785 7 0 | | | | 22 June. | Ditto. |
| | 2,802 22 8 | | | | 18 Oct. | 5 Jan. 1820. |
| | 15,753 28 7 | | | | 1 Ditto. | 22 Sept. 1819. |
| | 7,376 0 11 | | | | 8 Ditto. | 6 May. |
| | 234 36 8 | | | | 18 Oct. | 5 Jan. 1820. |
| | 189 24 8 | | | | Ditto. | Ditto. |
| | 63,691 33 10 | 1,276 23 8 | 64,968 17 2 | 64,968 17 2 | | |
| | *Qy. 30,488 15 0 J. M. | | | 3,22,855 17 1½ | | |

# E 29. *a.*[(4)]—*(Continued.)*

| Factories 1819. | Quantity, Pieces and Tonnage as per Invoice. | Pieces and Tonnage. | Total Pieces and Tonnage. | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|
| **Piece Goods** | | | | | |
| | piece tons. cwt. | | | | |
| Benares, .... | 2,333 5 5 | | .. | .. 30 Jan. 1819. | 17 Mar. 1819. |
| | 4,000 8 0 | | .. | .. 12 July. | 12 Aug. |
| | 2,000 4 0 | | .. | .. 6 Aug. | 20 Sept. |
| | 3,520 7 0 | | .. | .. 10 Sept. | 11 Oct. |
| | 6,328 13 6 | | .. | .. 25 Oct. | 25 Ditto. |
| | 2,144 4 4 | | .. | .. 20 Nov. | 13 Dec. |
| | | 20,325 0 0 | 41 15 0 | | |
| Chittagong, .. | 19,970 43 17 | | .. | .. 12 Jan. | 4 March. |
| | 12,523 25 11 | | .. | .. 23 Feb. | 2 April. |
| | 30,120 62 16 | | .. | .. 12 Nov. | 20 Dec. |
| | | 62,613 0 0 | 132 4 0 | | |
| Cassimbazar, .. | 10,000 9 1 | | | 23 Jan. | 11 Feb. |
| | 66,00 6 3 | | | 20 March. | 31 March. |
| | 15,000 14 0 | | | 6 Dec. | 13 Dec. |
| | | 31,600 0 0 | 29 4 0 | | |
| Dacca, ......... | 120 0 6 | 120 0 0 | 0 6 0 .. | .. 31 Jan. | 12 Feb. |
| Golagore, .. & Barnagore, | 5,050 9 17 | | .. | .. 18 Feb. | 24 Feb. |
| | 3,128 6 9 | | .. | .. 19 March. | 22 March. |
| | 4,487 4 17 | | .. | .. 26 Ditto. | 7 April. |
| | 7,750 16 2 | | .. | .. 12 July. | 25 July. |
| | 5,660 11 10 | | .. | .. 27 Oct. | 28 Oct. |
| | 20,318 42 0 | | .. | .. 10 Dec. | 28 Dec. |
| | | *46,393 0 0 | †90 15 0 | | |
| Midnapore, ... | 6,105 15 5 | 6,105 0 0 | 15 5 0 .. | .. 20 Nov. | 26 Nov. |
| Hurripaul, ... | 3,653 7 3 | | .. | .. 23 March. | 26 March. |
| | 2,261 4 7 | | .. | .. 14 July. | 17 July. |
| | 5,075 10 1 | | .. | .. 31 Dec. | 8 Jan. 1820. |
| | | 10,989 0 0 | 21 11 0 | | |
| Luckipore, ... | 8,240 18 13 | | .. | .. 6 Jan. | 19 Jan. 1819. |
| | 2,461 6 3 | | .. | .. 25 Ditto. | 19 Feb. |
| | 23,300 49 13 | | .. | .. 29 March. | 6 May. |
| | 22,520 50 14 | | .. | .. 25 May. | 10 July. |
| | 23,885 57 9 | | .. | .. 2 Sept. | 23 Sept. |
| | | ‡72,158 0 0 | 182 12 0 | | |
| Malda, .. .... | 300 0 15 | | .. | .. 23 Jan. 1819. | 16 Feb. 1819. |
| | 360 0 16 | | .. | .. 3 July. | 23 July. |
| | 780 0 19 | | .. | .. 23 Oct. | 5 Nov. |
| | | 1,440 0 0 | 2 10 0 | | |
| Rungpore, ... | 2,882 5 7 | | .. | .. 15 Jan. | 27 Feb. |
| | 1,000 1 16 | | .. | .. 17 Sept. | 12 Oct. |
| | 593 1 13 | | .. | .. 30 Nov. | 28 Dec. |
| | | 4,475 0 0 | 8 16 0 | | |
| Patna, .. .... | 4,486 8 10 | | .. | .. 23 Jan. | 27 Feb. |
| | 5,202 10 0 | | .. | .. 25 Feb. | 29 March. |
| | 9,491 10 0 | | .. | .. 5 July. | 26 July. |
| | | 19,179 0 0 | 28 10 0 | | |
| Burron, .... | 859 2 1 | | .. | .. 24 July. | 30 July. |
| | 1,356 3 4 | | .. | .. 19 Nov. | 24 Nov. |
| | | 2,215 0 0 | 5 5 0 | | |
| | Carried over, | 2,77,612 0 0 | 558 13 0 | | |

* Qy. 46,513 0 0 J. M.
‡ Qy. 80,406 0 0 J. M.
† Qy. 91 1 0 J. M.

# E 29. *a.*[4]—*(Continued.)*

| Factories. 1819. | Quantity, Pieces and Tonnage as per Invoice. | Pieces and Tonnage. | Total Pieces and Tonnage. | | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|---|
| | Brought over, | 2,77,612 0 0 | 558 13 0 | | | |
| **Soonamooky,..** | 621 0 18 | | | .. | .. 23 Jan. | 1 Feb. |
| | 1,410 4 6 | | | .. | .. 29 Ditto. | 11 Ditto. |
| | 143 0 7 | | | .. | .. 19 April. | 30 April. |
| | 560 1 8 | | | .. | .. 12 Oct. | 25 Oct. |
| | 422 0 12 | | | .. | .. 23 Dec. | 8 Jan. 1820. |
| | | 3,156 0 0 | 7 11 0 | | | |
| | | 2,80,768 0 0 | 566 4 0 | | | |
| **Carpet.** | | | | | | |
| **Benares.** | 50 4 11 | | | .. | .. 6 Aug. | 20 Sept. 1819. |
| | 10 1 5 | | | .. | .. 10 Sept. | 11 Oct |
| | | 60 0 0 | 5 16 0 | | | |
| **Gunnies.** | | | | | | |
| **Malda.** | 5,650 4 0 | | | .. | .. 25 Jan. | 16 Feb. |
| | 3,800 3 4 | | | .. | .. 3 July. | 23 July. |
| | 1,680 2 6 | | | .. | .. 23 Oct. | 3 Nov. |
| | | 11,130 0 0 | 9 10 0 | | | |
| | | 2,91,958 0 0 | 581 10 0 | | | |

# E 29. a.

| Factories 1820. | Net Weight as per Invoice. Fy. Mds. Sr. Cht. | Estimated Tare. Fy. Mds. Sr. Cht. | Total Gross Weight. Fy. Mds. Sr. Cht. | Grand Total. Fy. Mds. Sr. Cht. | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|---|
| **Raw Silk.** | | | | | | |
| Bauleah. .... | 289 35 4 | | | .. .. | 25 Jan. 1820. | 4 Feb. 1820. |
| | 218 0 0 | | | .. .. | 11 Feb. | 23 Ditto. |
| | 200 0 0 | | | .. .. | 29 Ditto. | 13 March. |
| | 170 0 0 | | | .. .. | 17 March. | 31 Ditto. |
| | 438 35 12 | | | .. .. | 1 July. | 11 July. |
| | 229 25 0 | | | .. .. | 5 Oct. | 20 Oct. |
| | 268 15 5 | | | .. .. | 9 Dec. | 22 Dec. |
| | 150 0 0 | | | .. .. | 30 Ditto. | 13 Jan. 1821. |
| | 1,964 31 5 | 191 32 8 | 2,156 23 13 | | | |
| Commercolly. | 40 2 4 | | | .. .. | 23 Jan. | 3 Feb. 1820. |
| | 40 2 8 | | | .. .. | 31 Ditto. | 14 Ditto. |
| | 40 2 5 | | | .. .. | 6 Feb. | 16 Ditto. |
| | 33 19 13 | | | .. .. | 11 Ditto. | 22 Feb. |
| | 40 2 8 | | | .. .. | 19 Ditto. | 2 March. |
| | 40 2 8 | | | .. .. | 29 Ditto. | 9 Ditto. |
| | 36 7 8 | | | .. .. | 10 March. | 20 Ditto. |
| | 22 30 6 | | | .. .. | 17 Ditto. | 28 Ditto. |
| | 40 2 8 | | | .. .. | 14 April. | 28 April. |
| | 62 2 12 | | | .. .. | 17 May. | 29 May. |
| | 64 4 2 | | | .. .. | 28 April. | 10 Ditto. |
| | 68 4 4 | | | .. .. | 17 June. | 27 June. |
| | 46 9 10 | | | .. .. | 8 July. | 17 July. |
| | 42 2 10 | | | .. .. | 13 Sept. | 20 Sept. |
| | 39 2 2 | | | .. .. | 26 Ditto | 2 Oct. |
| | 27 28 6 | | | .. .. | 8 Nov. | 17 Nov. |
| | 50 4 13 | | | .. .. | 20 Ditto. | 2 Dec. |
| | 40 2 8 | | | .. .. | 27 Ditto. | 8 Ditto. |
| | 32 3 7 | | | .. .. | 7 Dec | 19 Ditto. |
| | 34 2 2 | | | .. ... | 29 Ditto. | 9 Jan. 1821. |
| | 838 19 0 | 116 3 4 | 954 22 4 | | | |
| Cossimbazar. .. | 200 0 0 | | | .. .. | 7 Feb. 1820. | 17 Feb. 1820. |
| | 182 0 0 | | | .. .. | 6 March. | 18 March. |
| | 200 0 0 | | | .. .. | 24 Ditto. | 3 April. |
| | 119 16 0 | | | .. .. | 15 April. | 24 Ditto. |
| | 285 26 12 | | | .. .. | 26 June. | 4 July. |
| | 250 0 0 | | | .. .. | 19 Aug. | 5 Oct. |
| | 249 30 4 | | | .. .. | 30 Sept. | 25 Ditto. |
| | 280 0 0 | | | .. .. | 30 Oct. | 8 Nov. |
| | 300 0 0 | | | .. .. | 25 Nov. | 2 Dec |
| | 298 14 8 | | | .. .. | 23 Dec. | 29 Ditto. |
| | 2,365 7 8 | 215 1 0 | 2,580 8 8 | | | |
| Hurripaul. .. | 30 20 13 | | | .. .. | 22 Mar. 1820. | 25 Mar. 1820. |
| | 30 1 4 | | | .. .. | 31 Ditto. | 6 April. |
| | 1 34 14 | | | .. .. | Ditto. | Ditto. |
| | 100 7 0 | | | .. .. | 19 Sept. | 22 Sept. |
| | 110 2 3 | | | .. .. | 22 Ditto. | 25 Ditto. |
| | 104 3 14 | | | .. .. | 8 Oct. | 11 Oct. |
| | 348 19 13 | | | .. .. | 9 Ditto. | 20 Ditto. |
| | 125 38 9 | | | .. .. | 12 Dec. | 16 Dec. |
| | 851 8 6 | 96 12 0 | 947 20 6 | | | |
| | Carried over, | .. .. | 6,638 34 15 | | | |

## E 29. a.[5]—(*Continued.*)

| Factories. 1820. | Net Weight as per Invoice. Fy. Mds. Sr. Cht. | Estimated Tare. Fy. Mds. Sr. Cht. | Total Gross Weight. Fy. Mds. Sr. Cht. | Grand Total. Fy. Mds. Sr. Cht. | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|---|
| | Brought over, | .. .. | 6,638 34 15 | | | |
| Gonatea, .... | 128 4 13 | | | | 3 Feb. | 15 Feb. |
| | 76 2 14 | | | | 17 March. | 1 April. |
| | 142 4 14 | | | | 10 July. | 29 July. |
| | 160 5 0 | | | | 13 Aug. | 2 Sept. |
| | 160 5 0 | | | | 4 Sept. | 15 Ditto. |
| | 72 5 0 | | | | 30 Ditto. | 11 Oct. |
| | 92 2 8 | | | | 21 Dec. | 4 Jan. 1821. |
| | 74 2 5 | | | | 31 Ditto. | 20 Ditto. |
| | 904 32 6 | 149 29 0 | 1,054 21 6 | | | |
| Jungypore, .. | 60 1 10 | | | | 10 Jan. 1820. | 22 Jan. 1820. |
| | 192 4 6 | | | | 11 Feb. | 23 Feb. |
| | 152 2 8 | | | | 7 March. | 18 March. |
| | 432 19 12 | | | | 21 June. | 30 June. |
| | 281 24 6 | | | | 1 Sept. | 9 Sept. |
| | 260 3 5 | | | | 6 Oct. | 20 Oct. |
| | 1,378 15 15 | 194 2 8 | 1,572 18 7 | | | |
| Malda, .. .. | 37 24 14 | | | | 21 Jan. | 8 Feb. |
| | 64 0 11 | | | | 16 Feb. | 4 March. |
| | 319 15 8½ | | | | 10 July. | 22 July. |
| | 54 2 15½ | | | | 15 Sept. | 25 Sept. |
| | 475 4 1 | 69 0 0 | 544 4 1 | | | |
| Radnagore, .. | 77 22 0½ | | | | 18 Jan. | 14 Feb. |
| | 19 28 6 | | | | 14 Feb. | 22 Ditto. |
| | 601 38 3 | | | | 25 Sept. | 4 Oct. |
| | 410 11 0 | | | | 10 Nov. | 17 Nov. |
| | 150 4 0 | | | | 19 Dec. | 26 Dec. |
| | 1,259 23 9½ | 155 37 0 | 1,415 20 9½ | | | |
| Rungpore, .. | 20 0 0 | | | | 29 Jan. | 2 March. |
| | 102 0 0 | | | | 31 Ditto. | 10 Ditto. |
| | 118 5 14 | | | | 27 June. | 21 July. |
| | 125 23 10 | | | | 20 Ditto. | 22 Ditto. |
| | 365 29 8 | 55 20 0 | 421 9 8 | | | |
| | | | | 11,646 28 14½ | | |
| SALTPETRE. | | | | | | |
| Etawah, & Calpie,...... | 6,982 20 0 | | | | 20 Mar. 1820. | 11 July, 1820. |
| | 1,032 20 0 | | | | Ditto. | 14 Ditto. |
| | 8,175 0 0 | | | | 8 April. | 24 July. |
| | 8,872 20 0 | | | | 8 May. | 4 Aug. |
| | 7,450 0 0 | | | | 14 June. | 21 Ditto. |
| | 1,000 0 0 | | | | 19 Ditto. | Ditto. |
| | 2,625 0 0 | | | | 14 July. | 19 Sept. |
| | 6,100 0 0 | | | | 18 Ditto. | 20 Ditto. |
| | 42,237 20 0 | 1,900 27 8 | 44,138 7 8 | 44,138 7 8 | | |
| | Carried over, | .. .. | .. .. | 55,784 36 6½ | | |

## E 29. *a.*[5]—(*Continued.*)

| Factories. 1820. | Net Weight as per Invoice. Fy. Mds. Sr. Cht. | Estimated Tare. Fy. Mds. Sr. Cht. | Total Gross Weight. Fy. Mds. Sr. Cht. | Grand Total. Fy. Mds. Sr. Cht. | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|---|
| | Brought over, | .. .. | .. .. | 55,784 36 6½ | | |
| Patna, .. .. | 7,416 0 0 | | | | 6 Jan. | 9 March. |
| | 21,326 0 0 | | | | 22 July. | 8 Sept. |
| | 47,366 0 0 | | | | 29 Aug. | 11 Oct. |
| | 12,462 0 0 | | | | 15 Sept. | 9 Nov. |
| | 13,022 0 0 | | | | 31 Ditto. | 2 Ditto. |
| | 14 694 0 0 | | | | Ditto. | 10 Ditto. |
| | 4,952 0 0 | | | | 11 Oct. | 8 Ditto. |
| | 3,268 0 0 | | | | Ditto. | Ditto. |
| | 24,112 0 0 | | | | 19 Ditto. | 10 Jan. 1821. |
| | 10,796 0 0 | | | | 31 Ditto. | 1 Ditto. |
| | 1,000 0 0 | | | | 1 July. | 11 Ditto. |
| | 1,60,414 0 0 | 4,260 39 14 | 1,64,674 39 14 | 1,64,674 39 14 | | |
| SUGAR. | | | | | | |
| Benares, .... | 14,125 0 0 | | | | 7 July. | 19 Aug. 1820. |
| | 13,941 28 8 | | | | 1 Aug. | 18 Sept. |
| | 12,521 9 0 | | | | 2 Sept. | 11 Oct. |
| | 6,478 3 0 | | | | 1 Ditto. | 30 Ditto. |
| | 8,684 13 8 | | | | 4 Oct. | 23 Nov. |
| | 3,249 6 0 | | | | 6 Ditto. | 27 Ditto. |
| | 58,999 20 0 | 1,548 31 14 | 60,548 11 14 | 60,548 11 14 | | |
| COTTON. | | | | | | |
| Etawah & Calpee, .. | 13,552 32 1 | | | | 20 March. | 25 July. |
| | 14,487 9 0 | | | | 8 April. | 16 Aug. |
| | 4,119 10 7 | | | | 29 Ditto. | 1 Ditto. |
| | 13,723 15 1 | | | | 8 May. | 15 Ditto. |
| | 18,929 0 0 | | | | 5 June. | 5 Sept. |
| | 2,023 15 7 | | | | 10 Ditto. | 21 Aug. |
| | 14,775 38 11 | | | | 26 Ditto. | 25 Sept. |
| | 15,794 4 1 | | | | 18 July. | 30 Ditto. |
| | 15,666 29 10 | | | | 23 Sept. | 8 Dec. |
| | 15,533 12 14 | | | | 4 Oct. | 2 Jan. 1821. |
| | 1,28,605 7 4 | 7,159 9 14 | 1,35,764 *7 2 | 1,35,764 †7 2 | | |
| | | | | ‡4,16,772 18 4½ | | |
| | | | *†Qy. 1,35,764 17 2 J. M. | ‡ Qy. 4,16,772 15 4¼ or 4,16,772 25 4¼ J M. | | |

# E 29. a.[5]—*(Continued.)*

| Factories. 1820. | Quantity, Pieces, and Tonnage as per Invoice. | | | Pieces and Tonnage. | | | Total Pieces and Tonnage. | | | Date of Dispatch. | Date of Receipt. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PIECE GOODS. | Ps | Tons. | Cwt. | Ps. | Tons. | Cwt. | Ps. | Tons. | Cwt. | | |
| Benares, .... | 6,000 | 12 | 0 | | | | | | | 7 July. 1820. | 5 Aug. |
| | 5,000 | 10 | 0 | | | | | | | 20 Sept. | 21 Oct. |
| | 7,105 | 14 | 17 | | | | | | | 8 Nov. | 19 Dec. |
| | | | | 18,105 | 36 | 17 | | | | | |
| Chittagong, .. | 18,475 | 45 | 12 | | | | | | | 8 Jan. | 7 Feb. |
| | 24,200 | 50 | 17 | | | | | | | 29 Nov. | 11 Jan. 1821. |
| | | | | 42,675 | 96 | 9 | | | | | |
| Cossimbazar, | 18,000 | 16 | 15 | | | | | | | 25 Jan. | 4 Feb. 1820 |
| | 13,000 | 11 | 10 | | | | | | | 18 March. | 29 March. |
| | 5,375 | 4 | 14 | | | | | | | 22 April. | 6 May. |
| | 15,000 | 14 | 5 | | | | | | | 30 Nov. | 7 Dec. |
| | 10,000 | 9 | 3 | | | | | | | 20 Dec. | 26 Ditto. |
| | | | | 61,375 | 56 | 7 | | | | | |
| Dacca, ...... | .. | .. | .. | 1,650 | 4 | 1 | | | | 1 May. | 17 May. |
| Golagore & Barnagore, | 4,245½ | 8 | 4 | | | | | | | 12 Jan. 20. | 13 Jan. |
| | 6,735 | 13 | 17 | | | | | | | 12 Feb. | 12 Feb. |
| | 2,600 | 5 | 9 | | | | | | | 25 March. | 3 April. |
| | 9,150 | 18 | 2 | | | | | | | 29 Ditto. | 6 Ditto. |
| | 3,710 | 7 | 16 | | | | | | | 31 Ditto. | Ditto. |
| | 4,414½ | 9 | 5 | | | | | | | 29 Ditto. | 12 Ditto. |
| | 1,190 | 2 | 0 | | | | | | | 10 May. | 17 May. |
| | 2,410 | 4 | 16 | | | | | | | 8 Ditto. | 22 Ditto. |
| | 773 | 1 | 12 | | | | | | | 19 Ditto. | Ditto. |
| | 1,050 | 2 | 4 | | | | | | | 29 June. | 4 July. |
| | 8,080 | 16 | 15 | | | | | | | 3 Oct. | 10 Oct. |
| | 1,995 | 4 | 4 | | | | | | | 28 Nov. | 2 Dec. |
| | 6,100 | 12 | 1 | | | | | | | 30 Ditto. | 8 Ditto. |
| | | | | 52,453 | 106 | 5 | | | | | |
| Hurriaul, .. | .. | .. | .. | 144 | 0 | 6 | | | | 8 Nov. | 17 Nov. |
| Midnapore, .. | 1,946 | 2 | 10 | | | | | | | 21 Jan. | 25 Jan. |
| | 1,129 | 2 | 16 | | | | | | | 2 March. | 10 March. |
| | 5,204 | 13 | 0 | | | | | | | 22 Nov. | 11 Dec. |
| | 1,896 | 4 | 14 | | | | | | | 31 Dec. | 15 Jan 1821. |
| | | | | 10,175 | 23 | 0 | | | | | |
| Hurripaul, .. | 1,441 | 2 | 9 | | | | | | | 28 March. | 12 April, 1820 |
| | 1,100 | 1 | 18 | | | | | | | 2 July. | 4 July. |
| | 5,330 | 10 | 3 | | | | | | | 16 Nov. | 20 Nov. |
| | | | | 7,871 | 14 | 10 | | | | | |
| Luckipore, .. | 6,620 | 14 | 6 | | | | | | | 7 Jan. | 24 Jan. |
| | 6,420 | 14 | 5 | | | | | | | 10 Feb. | 3 March. |
| | 6,300 | 14 | 8 | | | | | | | 10 March. | 15 Ditto. |
| | 6,300 | 14 | 8 | | | | | | | 8 April. | 29 Ditto. |
| | 9,602 | 21 | 8 | | | | | | | 19 June. | 18 July. |
| | 12,500 | 27 | 11 | | | | | | | 31 Dec. | 27 Jan. 1821. |
| | | | | 47,742 | 106 | 6 | | | | | |
| Malda, ...... | 175 | 0 | 4 | | | | | | | 21 Jan. | 8 Feb. 1820 |
| | 615 | 0 | 15 | | | | | | | Ditto. | Ditto. |
| | | | | 790 | 0 | 19 | | | | | |
| Rungpore, ... | .. | .. | .. | 400 | 1 | 0 | | | | 14 Feb. | 9 March. |
| Soonamooky, .. | .. | .. | .. | 1,110 | 1 | 13 | 2,44,490 | 447 | 13 | 30 Dec. | 15 Jan. 1821. |
| GUNNIES. | | | | | | | | | | 2 Sept. | 15 Sept. 1820. |
| | | | | | | | | | | 6 Nov. | 23 Nov. |
| Malda, .. .. | 9,743 | 7 | 11 | | | | | | | | |
| | 3,700 | 3 | 4 | | | | 13,443 | 10 | 15 | | |
| | | | | | | | 2,57,933 | 458 | 8 | | |

# E 29. *a.*[6]

## ABSTRACT.

| | Raw Silk. | | | | Saltpetre. | | | | Sugar. | | | | Cotton. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Fy. Mds. | Sr. | Cht. | | Fy. Mds. | Sr. | Cht. | | Fy. Mds. | Sr. | Cht. | | Fy. Mds. | Sr. | Cht. | | Fy. Mds. | Sr. | Cht. | |
| 1816. | 6,960 | 1 | 6¼ | | 1,04,025 | 24 | 14 | | 2,022 | 20 | 12 | | 16,958 | 16 | 14 | | 1,29,966 | 23 | 14¼ | |
| 1817. | 9,722 | 38 | 9¼ | | 1,53,528 | 5 | 8 | | 30,959 | 39 | 14 | | 28,466 | 10 | 6 | | 2,22,677 | 14 | 5¼ | |
| 1818. | 9,483 | 0 | 4¼ | | 1,55,565 | 5 | 4 | | 33,446 | 0 | 11 | | 32,383 | 9 | 11 | | 2,30,877 | 15 | 14¼ | |
| 1819. | 11,695 | 35 | 5½ | | 2,14,898 | 38 | 14 | | 31,292 | 5 | 12 | | 64,968 | 17 | 2 | | 3,22,855 | 17 | 1½ | |
| 1820. | 11,646 | 28 | 14½ | | 2,08,813 | 0 | 6 | | 60,548 | 11 | 14 | | 1,35,764 | 17 | 2 | | 4,16,772 | 18 | 4½ | |
| | 49,508 | 24 | 7¾ | | 8,36,830 | 34 | 14 | | 1,58,268 | 38 | 15 | | 2,78,540 | 31 | 3 | | 13,23,149 | 9 | 7¾ | |

| | Piece Goods. | | | Carpets. | | | Gunnies. | | | Total. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ps. | Tons. | Cwt. | Ps. | Tons. | Cwt. | Ps. | Tons. | Cwt. | Ps. | Tons. | Cwt. |
| 1816. ... | 4,50,607 | 835 | 13 | 236 | 29 | 3 | | | | 4,50,843 | 864 | 16 |
| 1817. ... | 4,04,362½ | 812 | 11 | 195 | 10 | 8 | | | | 4,04,557½ | 822 | 19 |
| 1818. ... | 3,70,303 | 765 | 2 | 257 | 18 | 2 | 7,800 | 6 | 9 | 3,78,360 | 789 | 13 |
| 1819. ... | 2,80,768 | 566 | 4 | 60 | 5 | 16 | 11,130 | 9 | 10 | 2,91,958 | 581 | 10 |
| 1820. ... | 2,44,490 | 447 | 13 | | | | 13,443 | 10 | 15 | 2,57,933 | 458 | 8 |
| | 17,50,530½ | 3,427 | 3 | 748 | 63 | 9 | 32,373 | 26 | 14 | 17,83,651½ | 3,517 | 6 |

Errors Excepted,

Export Warehouse
*30th March*, 1822.

*(Signed)* F. MACNAGHTEN.
*Officiating S. E. W. H. Kr.*

(1) Paper E. Para. 6.

# [1]E 30.

LIEUT. R. C. FAITHFULL,

*Secretary Special Committee Lieutenant Schalch's Plan.*

SIR,

We beg to apologize for not having earlier replied to your Letter of the 16th ultimo accompanied by a Map and Lieutenant Schalch's Memorial, also a List of Queries which we have now the pleasure of returning with our sentiments.

We remain, &c.

CALCUTTA, *(Signed)* STEWART & ROBERTSON.
*12th Feb.* 1822.

# E 30 *a.*

List **No. 6.**

1. None worthy of mention to the Western Provinces or countries west of Bogowangollah, as goods are always landed at that place, particularly the great staple articles of Cotton, Sugar, Saltpetre, and Piece Goods, for one, two, or three months rather than take them farther during the stormy months of March, April, and May, and the most dangerous part of the Navigation is considered from Bugowangolah to Culna [Koolna] where it is proposed to commence the Canal.

(2) Paper E. Para. 46

2. [2]A Basin at Chitpore for the reception of the large up-country boats loaded with Cotton, Saltpetre, Sugar, during the months of March, April, May, June, and the greater part of July, would be of great value, as a protection against the heavy *Bores* and stormy weather of those months.

(3) Paper E Para. 38.

3. [3]A direct Navigation at all seasons to and from the Western Provinces, supposing it to commence at Rajemohul, would even admit of one per cent on the Trade; and were the undertaking considerably to exceed the sum stated (31 lacs,) would in a few years not only pay the cost, but become a source of Revenue.

4. No doubt as far as regards the consumption of the Town. The articles of export, Rice excepted, are not worthy of mention.

(4) Paper E. Para. 27.

5. [4]Fourteen days to one month, additional Freight, and loss of time, by coming by the Sunderbunds. The Natives of Benares who are in the habit of insuring goods to Calcutta will not take a risk by the Sunderbunds. The River Insurance Company do, though we do not immediately know the rates

6. As above.

7. On Application to the Custom House will give this correctly.

8. @ 10. Written " ditto," ditto."

# E 31.[1]

(1) Paper E. Para. (

To R. C. FAITHFULL, ESQ.
*Secretary Special Committee Lieutenant Schalch's Plans.*

SIR,

We have the honor to acknowledge the receipt of your letter of the 17th January, conveying a plan and sundry papers relative to Lieutenant Schalch's Scheme of opening a passage through the Sunderbunds communicating with the Eastern and Western Provinces.

We do not feel competent to reply to many of the Queries submitted, but such information as the experience of our own business affords on the subject, we willingly furnish.

We have therefore to observe, that to the end of 1818 the communication with the Western Provinces was invariably open through the Mattabanga, Jellingy, and Bogrutty.

In 1819, the Jellingy and Bogrutty, during the dry Season became unnavigable for heavy Boats, and such were compelled to go round by the Sunderbunds till the month of March; this year we did little business in Cotton; and of Boats employed in the transport of Indigo, the greater portion found their way through the Jellingy and Bogrutty, the remainder by the Sunderbunds,—which occasioned a delay only of [2] eight days in their arrival at Calcutta. (2) Paper E. Para. 5

In 1820, the direct passage was during the dry Season partially impeded, certainly not so much so as the preceding year, as all our Boats laden with Indigo came through the Jellingy, or Bogrutty; this year we did considerable business, employing about 250 Boats in the conveyance of Cotton and other bulky and weighty Goods, of which only 30 of the greatest burthen were obliged to go by the Sunderbunds—creating a delay in their arrival of about ten days.

In 1821, the Jellingy, and Bogrutty appear to have been navigable during the dry Season for boats of considerable burthen; we this year employed about 500 laden with Cotton, Saltpetre, Indigo, &c. of which only 12 went by the Sunderbunds, and without any actual necessity for going that route, as many of equal burthen at the same period came the direct passage; two boats laden with 150 bales of Cotton each left Bogwangollah in February, one went by the Sunderbunds and arrived in Calcutta in 29 days, the other came by the direct passage and completed in 24, making a difference of 5 days only; at this period no rain had fallen.

This year, 1822, all our Indigo boats, 40 in number, have come the direct passage, also boats laden with Saltpetre 500 Maunds each; so that as yet it appears to be navigable for boats of considerable burthen, and we have no doubt it will continue so this Season. From the preceding data we collect that to the end of the year 1818, there was no interruption of the direct communication with the Upper Provinces by the Jellingy, and Bagrutty.

That in 1819 and 1820 these Rivers were partially closed during the dry Season, and that heavy boats passing by way of the Sunderbunds were only about ten days longer on their passage to Calcutta, than they would have been could they have come the direct passage.

That in 1821 the Jellingy and Bagrutty were navigable throughout the year, and have continued so to this period (March 1822); whether this be owing to natural or artificial causes, we are not informed.

We are entirely ignorant of the Trade to and from the Eastward, and cannot consequently give any opinion how far the cost of the intended improvement of the Navigation of the Sunderbunds might be repaid by an import on that Trade.

We are decidedly of opinion that no considerable Revenue would arise from an impost on the Trade of the Western side, unless it be levied on Goods generally, whether they pass by the intended new route or other ways, as the Jellingy and Bogrutty, in the worst of times, are navigable nine months in the year for bulky and heavy goods, such as Cotton, Saltpetre (which rarely reach Bogwangollah before the small Rivers are completely navigable) Grain, Sugar, Metals, &c. and throughout the year for the light and more valuable property, such as Indigo, Silk Piece Goods, &c. which are generally imported into Calcutta in the dry Season.

We do not conceive much time would be saved to Boats proceeding through the intended new Cut; we have shewn *above*, that only ten days are lost in going from Bogwangollah by the present route of the Sunderbunds beyond what would have been required to come the direct passage through the Jellingy; it might possibly be more safe, though we have never yet lost a boat in the Sunderbunds, our losses always occur before they reach Bogwangollah, and we estimate them at one per cent.

As far as relates to the Western Trade, we conceive it a more advisable measure to endeavour by some means to improve the Navigation of the small Rivers, which being open for the passage of heavy Boats during nine months, and for light ones all the year, might, we imagine, be accomplished; and to defray the expenses of which all Boats passing should contribute.

Regarding the expediency of forming a Basin at Chitpore, it might be an acquisition to the Eastern Trade, but we do not think it would benefit those engaged in the Western, almost all the merchants, including the Honorable Company, have Godowns and Screw-houses on the banks of the River, and many of them have Canals for the reception of these Boats, where they are effectually protected from the Bore, which is most violent, in the Rains, when no Indigo is on the River, but Cotton Boats in vast numbers; these *find ample* shelter however in the *numerous* Nullahs between this and Hoogly, and little time is lost, as the Rowannahs covering the Goods have to be examined, which is done whilst the Boats are detained in the Nullahs till the danger is passed.

We have delayed our reply to your letter thus long, in order that we might ascertain by our Indigo Boats the navigable state of the small Rivers this Season, and as before noticed, they have all come down with ease and safety, and with as much speed as we have ever known; the only complaints we have heard from the men in charge of them is, that of fallen trees having occasionally impeded their progress, but such obstructions we conceive might be removed at a very moderate expense.

We have the honor to be, &c.

(*Signed*) MERCER AND CO.

CALCUTTA,
*15th March*, 1822.

## [1]E 32.

(1) Paper E. para. 6.

To MAJOR FAITHFULL,

*Secretary to the Special Committee appointed to Report on Lieut. Schalch's Plans.*

SIR,

I have the honor to acknowledge the receipt of your letter of the 1st Dec. 1821, with its enclosures, as also your letter of the 30th ultimo.

It would have afforded me considerable satisfaction, had the nature of the Queries forwarded to me in the first of your letters above acknowledged, been such as to have enabled me to have offered any observations worthy the notice of the Committee ; but as the subject is one with which I am by no means familiar, I trust the Committee will excuse my trespassing on their time with any remarks which, as they could not bear the test of experience, would probably be of little use, and irrelevant.

I have the honor, &c.

CALCUTTA, *(Signed)* D. C. SMYTH.

*10th May*, 1822.

## [2]E 33.

(2) Paper E. para. 6.

To CAPTAIN R. C. FAITHFULL, &c. &c.

*Fort William*

SIR,

I have received your letter of the 4th, and ought to have answered your former letter sooner. I am not sufficiently acquainted with the Inland Navigations of the Sunderbunds to give an opinion upon the line of Canals proposed by the Government. In another year I am of opinion that the Howleah River will be deemed by Government fully adequate to the purpose of allowing Boats of a moderate size, that is of one thousand Maunds, or downwards, to pass during all the dry Season. The large Char called Oochungha Dore, at the mouth of the Howleah River, is now cut away by the Ganges. Many suppose (and there are strong presumptions in favor of the supposition) that the bed of the Howleah River will be cut three feet lower by one inundation only ; it is probable too that the level of the bed of the Howleah River, now so much higher than the bed of the Ganges, may become nearly equal to the Ganges in depth. If then it be allowed that the water of the Ganges will procure a greater exit by Oochungha Dore having been cut away from the mouth of the Howleah River, then it may be easily admitted it will follow, that the plan of a Canal in the Sunderbunds will be unnecessary for the commerce of Western India; however, should it be found that the bed of the Howleah River has not deepened in the manner proposed during the ensuing inundation, then it may be worth while to consider the short distance between Hawnscolly and the Ganges; and you will perceive that the country in a line with the Howleah River contains so many Nullahs, the materials of which are evidently so hard as almost to prevent

the inundation from washing away the banks. I am tempted to believe that it would be perhaps easier to secure Fort William from the dangers with which it is threatened by bringing the Canal across to Hawnscolly than by Mr. Schalch's plan; it could be sooner finished, and at less expense, than the Sunderbund cut. If Lieutenant Schalch's Plan could be gone into at a moderate expense, it might be a desirable object of Inland Navigation for the Eastern parts of this fine country, which is yet only in a state of beginning improvements.

I am, &c.

(*Signed*) GEO. BOYD.

PUBNA,
*8th May*, 1822.

P. S.—The reason that the Howleah River has been so frequently embarrased with sand, was owing to the inundation being so straitened in its course by the large Char called Oochungha Dore; now the current is *straight* and rapid from *Surdah*, and will force the sand along with the greatest facility, and prevent the bed of the River being filled up.

Yours,

(*Signed*) G. BOYD.

(1) Paper E. para 6.

## [1] E 34.

To MAJOR, FAITHFULL,

*Secretary to the Special Committee to Report of Lieut. Schalch's Plan, Fort William.*

SIR,

In reply to your letter of the 9th January last, I have the pleasure to transmit Statements exhibiting the Collections of Tolls levied on Boats passing through Tolly's Nullah from May 1816 to April 1821.

2. The Statements exhibit the description of Boats, number of Boats, quantity of Maunds, rate and total amount of Tolls.

3. Statement No. 5 exhibits the estimated value of Ground situated in Punchawungong, extending from the Circular Road to the North-east extremities of the road.

I am, &c.

(*Signed*) C. TROWER,
*Collector.*

COLLECTOR'S CUTCHERRY,
24-*Purgunnahs*,
*13th May*, 1822.

## [1]E 34. *a.*

[1] Paper E. para. 43.

### *Statement exhibiting the Collections of Tolls levied on Tolly's Nullah from May* 1816 *to April* 1817.

| Description of Boats laden with Articles. | Number of Boats passed through Tolly's Nullah. | Total Quantity of Maunds laden on the Boats. | | | | Rate of Tolls per 100 Maunds. | | | Amount of Tolls Sa. Rs. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Boats laden with Salt, Chunam Charcoal, Timbers, &c. passed through Tolly's Nullah at Sherburn's Pool & Coot Ghaut. | 3,046 | 8,83,783 | 20 | 0 | 0 | @ 2 | 0 | 0 | 1,76,750 | 14 | 0 |
| Ditto, with Firewood & Grains &c. Ditto, ditto. | 10,714 | 33,48,754 | 0 | 0 | 0 | @ 1 | 0 | 0 | 33,487 | 13 | 0 |
| Ditto, with Bricks &c. ditto, ditto. | 84 | 13,985 | 0 | 0 | 0 | @ 0 | 4 | 0 | 34 | 15 | 10 |
| | | | | | | Total, Sa. Rs. | | | 51,198 | 10 | 10 |

Collector's Cutcherry,
24-*Purgunnahs*,
*The* 13*th May*, 1822.

Errors Excepted.

*(Signed)* C. TROWER,
*Collector.*

Paper E. para. 43.

# (1)E 34. *b*.

***Statement exhibiting the Collections of Tolls levied on Tolly's Nullah from May, 1817, to April 1818.***

| Description of Boats laden with Articles. | Number of Boats passed through Tolly's Nullah. | Total Quantity of Mds. laden on Boats. | | | | Rate of Tolls per 100 Mds. | | | Amount of Tolls Sa. Rs. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Boats laden with Salt, Chunam, Charcoal, Timbers, &c. passed through Tolly's Nullah at Sherburn's pool, and Coot Ghaut.** | 3,226 | 6,85,782 | 0 | 0 | 0 | @ 2 | 0 | 0 | 13,716 | 0 | 10 |
| **Ditto with Firewood, and Grains.** Ditto ditto. | 17,091 | 42,24.392 | 0 | 0 | 0 | @ 1 | 0 | 0 | 42,244 | 5 | 15 |
| **Ditto with Bricks** &c. ditto ditto. | 164 | 29,997 | 0 | 0 | 0 | @ 0 | 4 | 0 | 75 | 0 | 0 |
| | | | | | | Total, Sa. Rs. | | | 56,035 | 6 | 5 |

Collector's Cutcherry,
24-*Purgunnahs*,
*The* 13*th May*, 1822.

Errors Excepted.
*(Signed)* C. TROWER,
*Collector*.

## [1]E 34. *c.*

[1] Paper E. para. 43.

***Statement exhibiting the Collections of Tolls levied on Tolly's Nullah from May 1818, to April 1819.***

| Description of Boats laden with Articles. | Number of Boats passed through Tolly's Nullah. | Total Quantity of Mds. laden on Boats. | Rate of Tolls per 100 Maunds | Amount Tolls Sa. Rs. |
|---|---|---|---|---|
| Boats laden with Salt, Chunam, Charcoal, Timbers &c. passed through Tolly's Nullah at Sherburn's Pool and Coot Ghaut. . .. .. | 3,873 | 13,58,743 0 0 0 | @ 2 Rs. | 27,175 4 5 |
| Ditto with Fire-wood and Grains. Ditto, ditto. | 18,425 | 46,16,476 0 0 0 | @ 1 R. | 46,164 12 10 |
| Ditto with Bricks &c. ditto, ditto | 219 | 36,160 0 0 0 | @ 4 As. | 90 6 5 |
| | | | Total Sa. Rs. | 73,430 7 0 |

Errors Excepted.

(*Signed*) C. TROWER,
*Collector.*

COLLECTOR'S CUTCHERY,
24-PURGUNNAHS,
*The* 13*th May*, 1822

(1) Paper E. para. 43.

# (1) E 34. *d.*

***Statement exhibiting the Collections of Tolls levied on Tolly's Nullah from May* 1819 *to April* 1820.**

| Description of Boats laden with Articles. | Number of Boats passed through Tolly's Nullah. | Total Quantity of Mds. laden on the Boats. | Rate of Tolls per 100 Mds. | Amount of Tolls. Sa. Rs. |
|---|---|---|---|---|
| Boats laden with Salt, Chunam, Charcoal, Timbers, &c. passed through Tolly's Nullah at Sherburn's Pool and Coot Ghaut. .. .. .. | 4,826 | 17,02,832 4 8 2 | @ 2 Rs. | 34,057 3 10 0 |
| Ditto with Fire-wood and Grains. Ditto, ditto. | 14,850 | 39,35,286 0 0 0 | @ 1 R. | 39,352 13 15 0 |
| Ditto with Bricks &c. ditto, ditto. | 970 | 1,91,989 0 0 0 | @ 4 As. | 480 0 0 0 |
| | | Total, | Sa. Rs. | 73,890 1 5 1 |

Errors Excepted.
*(Signed)* C. TROWER,
*Collector.*

COLLECTOR'S CUTCHERY,
24-PERGUNNAHS,
*The* 13*th May*, 1822.

# [1]E 34. *e.*

[1] Paper E. para. 4

***Statement exhibiting the Collections of Tolls levied on Tolly's Nullah from May 1820 to April 1821.***

| Description of Boats laden with Articles. | Number of Boats passed through Tolly's Nullah. | Total Quantity of Mds. laden on the Boats | Rate of Tolls per 100 Mds. | Amount of Tolls Sa. Rs. |
|---|---|---|---|---|
| Boats laden with Salt, Chunam, Charcoal, Timbers, &c. passed through Tolly's Nullah at Sherburn's Pool and Coot Ghaut .. .. .. | 2,879, | 11,24,447 8 0 0 | @ 2 Rs. | 22,489 8 5 |
| Ditto, with Firewood and Grains. Ditto, ditto. | 14,447 | 40,64,703 0 0 0 | @ 1 R. | 40,647 0 5 |
| Ditto, with Bricks &c. ditto, ditto. | 773 | 1,76,762 0 0 0 | @ 4 As. | 441 14 10 |
| | | Total, | .. Sa. Rs. | 63,578 7 0 |

Errors Excepted.

(*Signed*) C. TROWER,
*Collector.*

COLLECTOR'S CUTCHERY,
24-PURGUNNAHS,
*The* 13*th May*, 1822.

(1) Paper E. para. 22.

## [1]E 34. *f.*

***Statement shewing the Estimated value of the Grounds situated in Punchawungong, extending from Circular Road to the North East extremities of the Road, as follows:—***

| Limitations. | Estimated value of the Ground extending from Circular road to the North-eastern extremities within 1,000 feet, per Cottah. | Estimated value of the Ground extending from Circular road to the North-eastern extremities within 2,000 feet, per Cottah. |
|---|---|---|
| From the Eastern Canal to the Balleaghattah Road. .. .. .. .. .. | 100 | 50 |
| From Balleaghattah Road, to the Sorrah Road. .. .. .. .. .. | 50 | 25 |
| From Soorah Road to the Mannick Tollah Road. .. .. .. .. .. | 40 | 20 |
| From Mannick Tollah Road to the Hautteebagawn. .. .. .. | 32 | 16 |
| From Hautteebagawn to Shaumbazar. | 32 | 16 |
| From Shaumbazar to Chitpore. .. .. | 100 | 50 |

Errors Excepted.
*(Signed)* C. TROWER,
*Collector.*

COLLECTOR'S CUTCHERY,
24-PURGUNNAHS,
*The 13th January,* 1822

## (1) E 35.

(1) Paper E. para. 6.

To MAJOR R. C. FAITHFULL.

*Secretary to the Special Committee on Lieutenant Schalch's Plans.*

SIR,

I beg to acknowledge the receipt of your Letter of the 3rd instant, and am sorry to say, that my Public avocations render it totally out of my power to answer those Questions referred by you concerning Lieutenant Schalch's Plans, nor am I sufficiently acquainted with those matters, to be of any service to the object under consideration.

I am, &c.

BAULEAH FACTORY, *(Signed)* R. B. BURNEY.
*11th May*, 1822.

## (2) E 36.

(2) Paper E para. 6.

To R. C. FAITHFULL, ESQ.

*Secretary Special Committee Lieutenant Schalch's Plans, Calcutta.*

SIR,

I have been duly favored with both your letters, which I sent round to the Society of this place; all appeared to be as ignorant as myself. I can give no opinion on the subject, never having been in the Sunderbunds nor ever in Calcutta for these last 17 years.

The Cossimbazar River, I am well convinced for these 20 years past, might have been kept open with the assistance of the Prisoners for 12 or 14 days, at an expense of two hundred Rupees a year in posts and mats.

I am, &c.

BOGLEPORE, *(Signed)* J. GLASS.
*9th March*, 1822

## (3) E 37.

(3) Vide paper marked E 8. & 8. *a*. J. M

Territorial Department,
Revenue.

GENTLEMEN,

I am directed by the Governor General in Council to acknowledge the receipt of your letter dated the 6th instant with its enclosure, and to inform you in reply, that His Lordship in Council has been pleased to approve the arrangements proposed by you in consequence of the approaching departure of your Secretary; you are accordingly authorized to give effect to that arrangement.

I have, &c.

COUNCIL CHAMBER, *(Signed)* HOLT MACKENZIE,
*14th February*, 1822. *Secretary to Government.*

(1) Paper E para. 6.

# [1]E 38.

To CAPTAIN R. FAITHFULL,

*Secretary to the Canal Committee, Calcutta.*

SIR,

I have now the pleasure of returning the Queries which the Canal Committee did me the honor to refer to me, with such replies as have occurred to me, supported by reasons which, I hope, may render them in some measure satisfactory.

I have, &c.

CHOWRINGHIE,
17*th May*, 1822.

(*Signed*) J. L. STUART, *Major*,
*Agent 2nd Div. A. C.*

(2) Paper E para. 11.

# [2]E 38. *a.*

List **No. 1.**

## *References on General principles, Practicability, &c. of Lieut. Schalch's Propositions.*

1. With respect to the practicability of forming a Line of Canals from Culna [Koolna] to Calcutta, I confess I was at one time apprehensive of some impediments which could only be surmounted by expensive measures—but from an attentive perusal of Lieut. Schalch's Memoir on the subject, I must acknowledge that he appears to have maturely weighed and reflected on the difficulties to be expected, and devised apparently excellent, though simple means of counteracting the obstacles in question. The tract of country between Culna [Koolna] and Calcutta being generally within the tides-way, I should consider it highly favorable to such an undertaking, as it would not only insure a certain regular supply of water for the purposes of Navigation, but also to clear the Canals occasionally of any sediments (that will of course lodge more or less) by Daming, up a part of them once a year, or when found requisite; another advantage would be the facility with which any partial repairs of the banks might be made at low water.

The circumstance of the proposed line being intersected by numerous streams, has its advantages as well as defects; for though they might occasionally injure the banks at the entrance of the Cuts, yet it would not be to any material extent, as the Jobanah and other Rivers which intersect that line of Country are not very rapid, consequently would not easily injure the stiff soil their banks are said to consist of; while, on the other hand, they would greatly tend to feed the Canals during the dry season, as the flood tide would have access at so many different points.

2. With respect to sediments, I should suppose the Ganges and Hoogly to contain a much larger proportion in the rains than the Sunderbund Rivers, and of a more pernicious quality for impeding their course by sands, yet it might be easily washed out of these Canals by draining them occasionally,—witness the Cut made by Captain Morrieson in the Sunderbunds, where I recollect the current was very strong on passing it in 1813, and as it has since stood well, we may infer that other Cuts also would stand,—particularly higher up,

where they would not be exposed to such a rapid tide. The circumstance of Goodlad's Cut and Tolly's Nullah having stood so long and well, are certainly fair criterions to form a favorable conclusion of what may reasonably be anticipated from the formation of a chain of such Canals.

3. With regard to dimensions, I should think the proposed Canal ought not to be less than 50 feet at low water mark, as the largest Boats ought to be able to pass each other at all times, and not less than 100 feet at top; indeed if a little more, it would perhaps be better. The track-ways might be considered, as all the excavated earth should be formed into a bund at least 30 or 40 feet from the edge of the Canal, as its weight if near the sides would tend to weigh down the banks; there are further reasons why the distance should be considerable, namely, to make allowance for any part that might give way; and as these bunds would also have in some places to sustain a great body of water in the rains, they ought to be on good foundations.

4. With reference to the nature of the strata of soil, I should think it probable some variation will be found in so long a line, and as a deep strata of sand would no doubt be a troublesome impediment, it would perhaps be advisable to ascertain this point by boring or sinking small wells at moderate distances; the method proposed by Lieut. Schalch to counteract the undermining of the banks from the washing out of the sand, seems very feasible, and would most probably answer if not very deep, but as such a formidable enemy should be avoided if possible, it might in some cases be worth while to make a considerable circuit.

Should any part of the Canal have a very deep strata of sand to pass through, the proposed 5 feet trench might require to be made a little broader in proportion to the depth of the strata, which it is reasonable to suppose would have the predicted effect; as if the slope was considerable at first, a small part of it settling on the under strata would not be likely to injure the rest, yet if it should do so it might be filled up with clay at low water spring tides.

5. In reply to the 5th Query I must speak with caution, having but a partial knowledge of the nature of the Salt Water Lake, yet from the description given of it by Lieut. Schalch, no doubt much good might be effected by some judicious formed bunds across it; and deepening the channel, would certainly facilitate the washing off the filth to a distance from the City, as he proposes,—which spacious drains with secure double sluices would no doubt effect without any risk.

6. Lieutenant Schalch's several motives for shutting up the Canal near the Hoogley in the rains appear rational and judicious, as the evil he alludes to should be cautiously guarded against; nor would any great convenience be attained by keeping it open for the obvious reasons he mentions; however, were it hereafter desired, I conceive it might be effected by efficient gates, though they would be very expensive, difficult to keep clear, and could only be opened with safety when near low water; I therefore think it would be advisable to relinquish that expensive and troublesome part of the plan, and adopt a secure mode of bunding. (1) Paper E. para. 76.

7. In reply to Query 7, the mode suggested in page 18 appears excellent, and teak would perhaps be preferable to saul timbers, as the worm would not affect them during the rains, whereas saul would most probably be destroyed unless it were found possible to preserve them by charing and paying with gull gull or coal tar, which might be tried experimentally before hand.

As a great strain would lay on the grooves in the Bund, it might be well to form them of large blocks of stone, which would not be liable to injury, and as it might hereafter be found expedient to furnish sluice gates at the proposed bund, it would perhaps be advisable to fit in proper hinges for such a purpose.

As the pressure would be great on these bunds at high tide, it would probably be servicable to have a strong wooden funnel, about the size of a shipwright's steam kiln, fitted into the bund with the efficient sliding sluices.

8—9. Lastly, the Harbour or Creek formed by the western end of the Canal would be of essential benefit, not only as a convenient shelter for boats in stormy weather, but it would likewise much facilitate their loading and unloading. The great importance of such a place of retreat may be in some measure appreciated by those who are aware of the numbers of boats that usually seek shelter in Bally Khaul Nullah, though upwards of two miles above Chitpore.

(*Signed*) J. L STUART,
*Agent 2nd Div. A C.*

CALCUTTA,
*16th May*, 1822

(1) Paper E. para. 6.

## (1)E 39.

To R. C. FAITHFULL, ESQ.
*Secretary Special Committee Lieutenant Schalch's Plans.*

SIR,

I have the honor to acknowledge the receipt of yours under date the 3rd instant, and in reply I am sorry to state that I am not possessed of any information that can assist the Committee in framing a report to Government.

I am, &c.

(*Signed*) J. ARMSTRONG,
*Acting Resident*

SARDAH FACTORY,
*16th May*, 1822.

(2) Paper E para. 6.

## (2)E 40.

To THE SECRETARY TO THE SPECIAL COMMITTEE,
*Lieutenant Schalch's Plans, Fort William.*

SIR,

I have the honor to acknowledge the receipt of your letter of the 19th December 1821, with its enclosures, on the subject of Lieutenant Schalch's plans.

2. Never having passed through the Sunderbunds myself, I am unable from personal knowledge or observation to communicate any information on the subject.

3. A gentlemen of well known experience and the greatest respectability, an old resident of this place, who has frequently travelled to Calcutta and back by the Sunderbunds, has been so obliging as to communicate some valuable information, which will enable me to reply to several of the Queries, and which I submit with confidence.

1. I have no personal knowledge of the part of the country through which the proposed Canals are to run, but from the report of others, I conceive the Scheme to be perfectly practicable, and no obstacles appear likely to oppose its accomplishment.

2. In [1]Goodlad's Creek, as the Flood tide flows in at both ends of it, where the two currents meet, there is a deposit of mud at high water, but, from the constant agitation of the water from the number of boats passing and repassing, this deposit is very inconsiderable, else the channel must have been filled up in the course of so many years since the Cut was made—[2]Morrisons's Cut rather deepens than otherwise. (1) Paper E. Para. 12. (2) Paper E. Para. 12.

3. The [3]influence of the Ebb and Flood Tides appears to be much more favourable to the permanency of the banks of the Streams or Canals where they flow, than where the water runs continually in one direction. The fact is proved by the very little, if any change which the different Canals in the Sunderbunds, under the influence of the tides, have undergone for the last thirty years. (3) Paper E. Para. 26.

4. The proposed [4]line of Canals must no doubt tend to increase the cultivation of the country through which it passes, provided there be no particular obstacle to oppose it (4) Paper E. Para. 27.

5. The Collectors of the 24-Purgunnahs, and Jessore, and the Commissioner of the Sunderbunds, are alone competent to answer this question.

6. Answer as above.

7 and 8. The same.

9. The precise number of boats lost between Tardah and Koolnah cannot be stated—nor even guessed at with any precision; but as that is by far the most dangerous part of the Navigation in going through the Sunderbunds to Calcutta, Lieutenant Schalch's projects would tend beyond all doubt to remove this danger.

10. 1. and 2. The Roymungul being by much the broadest stream in this Navigation, must consequently be the most dangerous part of it; and where, I imagine, the greatest number of Boats are lost.—The Magistrates of the 24-Purgunnahs and Jessore, by a reference to the records of their Offices, are the most competent to answer this question; but I have always understood that the Robberies between Culna [Koolna] and the mouths of the Megna are most frequent.

11. In the [5]fair season, that is from the beginning of November until the Southerly winds set in, in March, a boat that will take the advantage of the tide at night as well as in the day, will take only five days in going from Koolna to Calcutta—the less wind there is, the more favourable the weather for this navigation,—where the boats entirely depend upon the influence of the tides, and on their oars to get on: the channel being so very zig zag, that sails are of little or no use. (5) Paper E. Para. 27.

12. [6]It can only be generally observed that during the South-west Monsoon, the detentions are longest and most frequent; and that again depends upon the state of the weather, for when it has a threatening appearance the boatmen are very unwilling to leave Bissenpore and pass on to the Roymungul. (6) Paper E. Para. 23.

13. If the [7]communication with Calcutta at the back of the Circular Road could be rendered easier of access, there can be no doubt but that it would be preferred to that of [8]Tolly's Nullah, because it would bring boats so much nearer the Town; but the Navigation at present through the Salt Water Lake is attended with so much difficulty and delay, that Tolly's Nullah is preferred by most people. (7) Paper E. para. 19. (8) Paper E. para. 23.

14. There cannot be a question but that Lieutenant Schalch's route would be greatly preferred by all the Natives and others, to the present route through the Sunderbunds.

The assignable causes for such a preference are, that the Natives, particularly the Hindoo Boatmen, could always land in safety to cook their victuals, whenever they thought proper; and they could get a supply of fresh water whenever they did land; and further, they would be in no dread of Tigers, while their boats remained at anchor in the night.

15. This question I cannot answer, but by a reference to the records of the Salt Department, in which Mr. Goodlad's letter proposing to make the Cut will be found, the desired points can be ascertained.

16. I cannot answer this question.

17. Judging from appearances, I should imagine that nothing has been expended upon these Cuts since they were first made.

18. By a reference to the Insurance Offices of Calcutta alone, this point is to be ascertained.

19. Answered already,—it is not to be correctly ascertained.

20 and 21. These 2 Queries I cannot answer

22. Nor can I this.

23. There being a fixed rate of wages per month for the Dandies. I have never understood that going through the Sunderbunds has made any difference.

24. The above answer applies to this Query.

25. The adoption of Lieutenant Schalch's line of Canals would undoubtedly reduce the rate of Insurance, because it would render the Navigation through the Sunderbunds more safe, and would most likely also tend to reduce the rates of freight, from the short space of time required for the trip.

26. It cannot be answered with any precision. I have known the state of the weather to have prevented boats for fifteen days from venturing to leave Bissenpore and enter the Roymungul.

27. It being the object of all boats to perform their voyage as expeditiously as possible, there cannot be a doubt, I should imagine, but that up-country boats would prefer going by Lieut. Schalch's route to waiting until the Mathabungah and Bagretty passages were open.

28. It is to be supposed that boats of every description would be glad to have a place of protection from the Bore and stormy weather

4. The advantages which are likely to arise from Lieutenant Schalch's plan are of so general and so important a nature, and the obstacles that present themselves on the whole so inconsiderable, that it is to be hoped nothing will occur to prevent its being carried into speedy and immediate execution.

I am, &c.

(*Signed*) H. WALTERS,
*C. G. C.*

CHITTAGONG,
GOVT. CUSTOM HOUSE,
20*th May*, 1822.

# E 41.

(1) Paper E. para. 6.

To CAPT. R. C. FAITHFULL,

*Secretary Special Committee, Lieutenant Schalch's Plans, Calcutta.*

SIR,

I have the honor to acknowledge the receipt of your letter of the — December 1821, with enclosures, noted in the margin, and also of your Circular Letter of the 3d inst. and have now the pleasure to enclose the answers required.

A Map of the country between Koolnah and Calcutta.
Lieut. Schalch's Memoir.
A List of Queries.

I am, &c.

(*Signed*) C. CARDEW,
*Actg. Collector.*

ZILLAH BACKERGUNGE,
COLLECTOR'S OFFICE,
*The 25th May,* 1822.

# E 41. *a.*

List. **No. 3.**

1. I do not possess sufficient local knowledge of those parts of the Country, through which the principal Canals are proposed to be cut, to venture an opinion as to the practicability of the Scheme, and consequently no (2)objections occur to me as likely to oppose its accomplishment; there appears no obstacles to those at "Nusserpoor" and "Narole," and I conjecture there can be none to the others, unless the length of them be considered such from the difficulty in procuring labourers.

(2) Paper E. para. 6.

2. In Creeks or Cuts where the tide flows in from both ends, there will be a deposition of mud or sand where they meet, but in Goodlad's Creek, it being a passage through a Jeel, this has not had an effect such as to obstruct the passage; it never was so deep in the middle part as to admit boats of even a small burden to pass it, except on a flowing Tide, and such is the case now; no accumulation of mud or sand has taken place at Morrieson's Cut, nor is it likely to do so, it being short, and the tide strong and regular.

3. In this respect much depends upon the nature of the soil through which the Canal is cut, and the body of water to run through it.—Whether the flow is constant in one direction, or Tides prevail, the effect I conceive will be much the same – if straight, and the current or tides rapid the banks will give way until the Canal (as is the case with Morrison's) has formed for itself a bed sufficient to receive and discharge it.

4. A great (3)thoroughfare creates inducements for people to settle near it, and the proposed line of Canals cutting off the deep Sunderbunds, and thereby lessening the great dread of molestation from Tigers, I am of opinion that they will tend greatly to increase the cultivation of Jungly land in their vicinity.

(3) Paper E para. 27

5. This will be governed by local circumstances, but one rupee per* beegah may be judged a fair average when in a state of cultivation.

* This must be a mistake, Cottah is the question.—R. C. F. *Secretary.*

6. It is not probable that any assistance in labourers could be obtained from this District.

(1) Paper E. para. 50.

7. [1]It is not every where the same, in some places they are dug by the Cooah of 16 cubits square, 2½ deep. The first from the surface at 2/8 or 3 Rupees, the next 3/8 or 4 Rupees, and so on increasing one Rupee per Cooah with the depth. If the Tank is large, something more is required for the centre Cooahs.

8. Generally to about 6 feet vegetable earth, with a slight mixture of land [sand], to about 10 or 12 feet clay and land [sand], and 12 to 18 feet land [sand] and earth mixed together. In this District it is seldom that Tanks exceed 10 or 12 cubits in depth, as below that the progress is impeded by water.

9. There is no mode of ascertaining this here, but doubtless very heavy losses are sustained. The route laid down by Lieutenant Schalch would entirely cut off the points that are considered most dangerous in the Sunderbund Navigation, between Koolna and Tardah.

10 1. The Seepoah River and the Roymungul Seer, are the most particular points of danger, but the proportion of losses at them cannot be ascertained here.

(2) Paper E. para. 23.

10 2. There are I believe few depredations committed on the Rivers now, but they might occur without any knowledge of them reaching this District The [2]Pussour, near the Jubjubia, the Bhadhur, and the Seebpooah Rivers were formerly more particularly infested by robbers.

12. Generally in all large Rivers having nearly a North and South direction, and during the whole of the S.W. Monsoon, but more particularly at the Rivers Seepoah and Roymungul—rounding the point of the latter is very dangerous. The longest period of detention I cannot state, but loaded boats from this District seldom reach Calcutta in a month, and very frequently are much longer.

(3) Paper E. para. 19.

(4) Paper E. para 23.

13. Most undoubtedly a [3]communication with Calcutta at the back of the Circular Road, would possess advantages and inducements to the Sunderbund Navigation far beyond those afforded by [4]Tolly's Nullah.

(5) Paper E. para. 44.

14. The adoption of Lieutenant Schalch's route would be likely to remove all aversion to the Sunderbund Navigation on the part of the Native Boatmen. It in fact cuts it off almost entirely, and would be an object of preference not only over the old route but to every other in the South-west Moonsoon; for it is not so much the aversion to the Sunderbund route which operates, as the expense, delay, trouble, difficulties, and dangers that must be encountered to get through Tolly's Nullah. [5]Boats of 500 Maunds burden must at all seasons of the year be lightened of at least a third of their Cargo, to get safely through to the River, and when through, they are exposed to many and serious dangers from the Bore, the Shipping, and the unmanageableness of the Country Craft in so large a River as the Hoogly, and where so strong a tide runs. Were Lieutenant Schalch's plan adopted, the present Channel in the Salt Water Lake deepened, and widened where required (to do away the necessity which now exist of lightening boats to admit of their getting to a Ghaut,) so as to allow of large, (say, 1000 Mds.) boats coming up to the Harbour, as laid down in the Map, and sufficient depth of water in it to float boats at low ebb, it would afford eminent advantages over every other route to Calcutta.—Up-country Merchants would prefer it as giving greater security to their property, and the Rice Merchants of this place would, for the same reason, adopt it; thus it may be deemed desirable, and be considered an object of the highest importance by every person concerned in the interior Trade of the Country.

15. I cannot detail the original dimension's of Goodlad's Creek or Morrieson's Cut

The latter is very short, but what was the expense of excavating, or the length of time spent upon it, I have no means of ascertaining. There was always a passage for very small boats through the "Bopuldunga" Jeel—this Mr. Goodlad enlarged and deepened in the centre sufficient to allow a passage for those of greater burden. I have heard that [1]1,400 or 1,500 Rupees were expended the first year, and 400 or 500 Rupees the next, since that time I believe there has not been any thing done to it. It was a work of great utility, as it cut off the very intricate and dangerous passage by the Choonamoorah and Contahcatta.

(1) Paper E. para. 1

16. From the time of opening Lieutenant Morrison's Cut it continued enlarging itself, until it reached its present size: Goodlad's creek did the same, at the end running into the Jebuna River; nothing further has been observable in these Cuts since their formation.

17. I believe there is no annual expense incurred in keeping these Cuts in order.

Z. Backergunge, *(Signed)* C. CARDEW.
Collector's Office, *Actg. Collector.*
*The 25th May*, 1822.

## [2]E 42.

2) Paper E para 6 & 34.

To R. C. FAITHFULL, ESQ.

*Secretary to the Special Committee Lieutenant Schalch's Plans.*

Sir,

In obedience to the orders of the Special Committee, I now have the honour herewith to transmit to you for its information, such replies to the respective List of Queries (**Nos. 4,** and **5,**) which accompanied your Letters dated the 7th and 15th of January last, as I have been able to furnish myself, or to obtain from those natives around most capable of affording them.

2. Many causes, a recapitulation of which might here be out of place, have unavoidably prevented me from forwarding these replies to the Committee ere this time, I shall therefore only mention as one of the most prominent of them, the difficulty I experienced in eliciting from natives who have long been in the habit of navigating the Bhaugarithy, Jellinghee, and Mathabangah Rivers, any distinct account of them, variation which in former years occurred within their beds, or relative to other facts connected with the plan under consideration, which it would have been equally important to have gained a correct knowledge of.

3. The mode hitherto practised in removing partial obstructions from the bed of the Mathabangah River having been explained in the reply given to the 5th Query of List **No. 4,** I shall here endeavour to describe as briefly as possible, the operations noticed in the latter part of that reply, the success which resulted from them, and the ground upon which they were undertaken.

4. With this view I have accordingly subjoined three sketches exhibiting the Mathabangah in the immediate vicinity of Katchikottah, together with the head of the Como River, as in January 1820, 21, and 22.

5. On a reference to sketch No. 1 and to the soundings marked thereon (in feet), it will be observed that while there is scarce a depth of 2 feet of water in the Mathabangah River at A. B. C. D. E. and F., there is a depth of 30 feet across the head of the Como River, which at a very considerable distance below Katchikottah only decreases to 10 feet. Now the projecting point of hard clay between G. and H. above Neemtullah was the principal cause of the Como being so plentifully supplied with water, for the whole stream of the Mathabangah (flowing down from the Ganges) striking against it with great force was then deflected at right angles into the mouth of the former River.

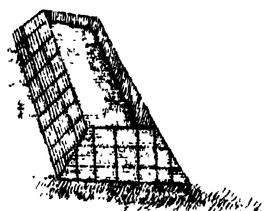
6 It was therefore proposed to Government by my predecessor, Mr. Robison, in January 1820, in order to counteract this ruinous direction of the current, and if possible to throw an additional quantity of water into the Mathabangah River, to cut a Canal from G. to I. (300 yds. long, 100 feet wide at the top, 36 feet deep, and 27 feet wide at the bottom, at an estimated expense of Sa. Rs. 8,614 : 7 : 0) which in the month of March following was sanctioned, but from the difficulty of procuring labourers, and various kinds of untoward circumstances, it was barely excavated to a depth of 19 feet when the rise of the River put a stop to the work. The rapid current however passing through the Canal in the rainy season nearly carried off the portion left uncut, besides about one half of the Island K. as shown on sketch No. 2.

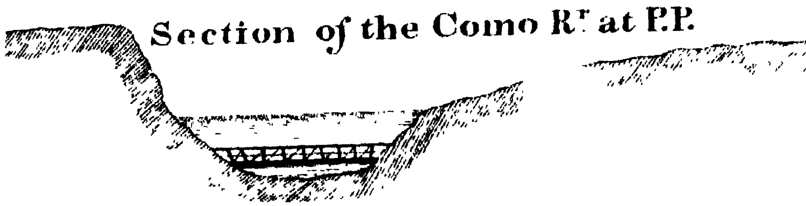
7. It was likewise suggested by Mr. Robison, in January 1820, to cut through the neck of land at the bottom of Neemtullah Reach from L. to M. in order to avoid the numerous extensive and dangerous shoals existing in the crooked Channel between Juggerhooddah and Luckipore, and I myself after having carefully surveyed that part of the River in December 1820, being positively convinced that no other scheme could be resorted to with any chance of permanently obviating them, again recommended to Government the expediency of its authorizing me to adopt that measure. The dimensions of the Canal I proposed to make, were as follows, viz. 600 yards long, 100 feet wide at the top, 27 feet deep, and 46 feet wide at the bottom, and the estimated expense of it Sa Rs. 11,493 : 0 : 10. This Canal was approved by Government in March 1821, and although previous to the inundation I was unable to excavate it to a greater depth than 23 feet, it was cut down by the stream to the level of the bed of the River during that period, excepting the small piece of clay,* and widened upwards of 90 feet.

* Vide Sketch, No. 3.

8. Having often reflected on the possibility of partially shutting up the Como River, and of thereby turning a portion of its water into the Mathabangah, I in the month of March 1821 submitted a plan to Government for this purpose, which was sanctioned in April following.

9. The method I employed was to sink a Caissoon built of Babool tree posts and Mango planks, of the shape shown on the margin* (50) feet long, 8 feet deep, 30 feet broad at the bottom, and 15 feet broad at the top, filled with bricks across the narrow channel of the Como at P. P. (vide section on the margin) together with 16 old boats of about 1,500 maunds burthen obliquely across its mouth from Q. to R. (vide sketch No. 2.) filled with earth taken from the Island, K. opposite,—through which I cut several deep ditches, to






facilitate its removal by the current in the ensuing inundation, and so speedily was this object effected by these simple means, that not a vestige of it remained in the beginning of July.

10. The early removal of this Island tended very much to ensure the successful result of the above operations, as before the steep banks of the Mathabangah were sufficiently impregnated with moisture, to render them easily corroded by the stream, (which was thus prevented from spreading to the same extent that it would have done at a later period of the inundation,) an immense body of water was thrown directly into it, in consequence of which, and the velocity of the current now greatly increased by shortening the long bend of the River from Juggerhooddah to Luckipore, the bottom of its channel (if I may be permitted to use the expression) was literally ploughed up at Neemtullah and Nuttedangah, and all the obstructions formerly existing under these villages swept away, as will be distinctly perceived by comparing sketches (No. 2 and 3) with each other.

11. It will also be noticed that the sand bank T. has been prolonged by running out the jetty of old boats from Q. to R. fully 200 yards, on account of which the stream has been directed about 400 yards further down the Mathabangah than exhibited in sketch (No 2.): that at A. and B. where in January 1821 there was scarce a depth of 3 feet of water, there were in January last 8½ feet; and that the Gwalberriah Khaul has become the main channel of the Mathabangah; the winding passage between Juggerhooddah and Luckipore being completely blocked up with sand: on the other hand the Committee will observe that the bed of the Como River has been at and below its point of separation from the Mathabangah very considerably raised, owing to the deposition of sand produced by sinking the Caissoon across its head, there being exactly a depth of 8 feet of water in January last, in the middle of the channel, at D. where in the same month of the preceding year there was a depth of 16 feet.

12. The best mode of permanently improving the head of the Mathabangah River, has for a long time occupied my most serious attention, and among other plans, I have had in contemplation the practicability of supplying it with a sufficiency of water throughout the year, by opening a Cut or Canal from the Ganges into it, has been maturely weighed, but from the rapid and extraordinary variations to which the course of the great River is annually subject, I am perfectly satisfied that no undertaking of this nature can ever be attended with success.

13 For a more convincing proof however of the truth of the above assertion, I beg leave to refer the Committee to the annexed Sketch (No. 4.) which exhibits the heads of the Mathabangah and Jellinghee Rivers, together with the Ganges adjoining, as in the end of June 1820, and upon which I have marked out in red the changes of that rainy season, and those of 1821, in blue.

14. During the inundation of 1820, a surface of 250 acres of land was carried off by the Ganges from its Southern bank between A. and B and the Western head of the Mathabangah River, which previously appeared as the one most likely to remain free, was entirely blocked up by a portion of the soil thus removed. The sandbank C., nearly a mile in length, and about 2 furlongs in breadth, was swept away, and the Eastern head of the

Mathabangah shifted 400 feet farther to the Eastward, by the encroachment of the stream upon the banks between D. and E.

15. During the rainy season of 1821, 215 acres of land were in like manner destroyed between F. and G. and the East head of the Mathabangah shifted again fully 600 feet farther to the Eastward, by the action of the current against the bank between H. and I. In short, the vicissitudes of one season, furnish no data to determine what the succeeding may bring forth, hence, in remedying the evils of this year, there is no assurance that those of the next shall be provided against.

16. It therefore appears evident to myself that all that can be usefully attempted at the head of the Mathabangah River for securing a constant communication through it, is the immediate removal of obstructions, so soon as they are discovered, and I am decidedly of opinion that this important object may be effected, by the aid of powerful Dredging machinery worked by Steam Engines.

17. Under this impression I submitted to Government the plan of a Dredging Machine in November last, to be worked by 6 oxen, which was approved of in January following, and it is now constructing by Messrs. Kyd and Co. in Calcutta, who have agreed to furnish the whole apparatus complete for Sa. Rs. 9,000. It is calculated that this Machine will operate in a depth of water not materially exceeding one cubit, that it will be capable of raising from 80 to 100 tons of sand per day from the bed of the River. I do not however expect that so small an apparatus will accomplish all that is necessary, yet I am satisfied that I shall be enabled to overcome partial obstructions with it at less expense, and more expeditiously, than by manual labour : the measure was therefore recommended as an experiment, and if no other good arises out of it, it will at least supply data to form a pretty correct estimate of what may be done with machinery upon a large scale.

18. The superiority which a bucket Dredging Machine possesses over every other method of excavating under water, is so well known, that it is unnecessary for me to say any thing on the subject here ; I may however remark, that, independent of the quantity of sand, which such an apparatus will actually lift from the bed of the River, its revolving buckets will at the same time most effectually harrow up the sand upon those flats it may be employed to clear away, the lighter particles of which will be floated down by the stream and deposited in the deeper parts of the channel ; and when I have often seen considerable impediments removed by dragging two or three heavy laden boats over them in a strong current, I confess I entertain sanguine expectations of the machine, above referred to, proving exceedingly useful.

19. Having now endeavoured to lay before the Committee all the information which I have had it in my power to afford regarding the Matabangah River, I shall conclude this letter by observing that I am not aware of any scheme that can be adopted for the purpose of obtaining a permanent *Canal* communication between the Rivers Ganges and Hoogley at less expense, or with a better chance of success than the one proposed by Lieut. Schalch, exclusive of the advantages which it holds out in respect to the Drainage of Calcutta.— That a more direct route however, for up-country Boats would have been preferable, cannot be denied, and that such will still be highly desirable, even in the event of the scheme in question being sanctioned by Government, will, I believe, be generally admitted, but this end is I fear not to be attained through the medium of any cut made in the higher parts of the country: I have no doubt indeed, from all I have been able to learn, of the practicability of carrying a Canal from (1)Rajhmahl to join the Bhaugritthee below Sootie, but when the

(1)Paper E. para. 38.

enormous expense which would attend the execution of a work of that magnitude, is taken into consideration, and that it is even doubtful whether or not an uninterrupted Navigation would for any length of time be secured by its formation, that plan must apparently be abandoned.

20. Should there be any other way in which my services (consistent with it [the] duties committed to my charge by Government,) can be of use to the Special Committee, may I take the liberty of respectfully requesting you to assure it, that I shall spare no pains to render them as much so as possible.

I have, &c.
*(Signed)* J. S. MAY,
*Sup. and Collector of Nuddeah Rivers.*

DEWANGUNGE,
*20th May*, 1822.

# E 42. *b*.

## List **No. 4.**

1. The Navigation between Calcutta and the Ganges by the Bhagaritthee River has been obstructed for Boats of the description referred to, during the months specified in each year excepting 1821, when it was passable for Boats of 500 Maunds to the end of June, that of the Matabangah River, with the exception of the years 1809, 10, 11, 12, 13, 14, 15, 16, 17, 18, and 22, and that of the Jellinghee River for these twenty years past. In the present Dry Season, however, it has been open for Boats of 500 Maunds in all January, and for Boats of 300 Maunds until the beginning of March.

2. (1)The Navigation of the Matabangah River was closed to Boats of such burthen, in the Dry Seasons of 1819, 20, and 21, generally from the month of February to the middle of June, and that of the Bhagaritthee and Jullinghee Rivers from January in each year, to the latter end of June. (The seasons mentioned in the above reply excepted.) (1) Paper E para 32

3. The principal obstructions to the Jullinghee and Bhagaritty Rivers, (especially to the former) have always existed at or near their heads, occasioned by enormous masses of sand thrown into them by the Ganges during the periodical inundations. In the month of March 1821, while I was surveying the heads of the Matabangah and Jullinghee Rivers, I found the bed of the latter River completely dry for a distance of 6 miles below its entrance, save where a little water remained in the deep pools, stagnant. The most extensive and dangerous obstructions to the Matabangah River in 1819, 20, and 21, were situated between its head and Dewangunge (a distance of 5½ miles) some of these had their origin in the Ganges, but the greater number of them were produced within itself, by the rapid encroachment of the stream upon the banks, which in that part of its course are almost wholly composed of sand; consequently the deposition of the sand, thus removed, generated extensive shoals, at intermediate spots of the Channel. The least depth over these obstacles may have been from 15 to 20 inches; nevertheless, a sufficient quantity of water passed over, and filtered through them, to allow Boats of 300 Maunds burthen to proceed without much difficulty between Dewangunge and Katchikottah, during the hot months, where again the Como River, which branches off at the latter village, to the Eastward, robbed the Matabangah of three-fourths of its water, and rendered it totally unnavigable from thence, for boats of the smallest size, to Kisto Gunge. The points most obstructed

between Katchikottah and Kisto Gunge were at Nuttedangah, Juggerhooddah, Rungpore, Gualberiah, Gobindpore, and Muttrapore. The Matabangah has also from time to time been very seriously injured by sunken boats, wood rafts, and trees, the removal of which from its bed (in former years) was seldom attempted until they were so deeply immersed in the sand as to render every effort to that end worse than useless. In August 1818, a native wood merchant had a fleet of saul and sissoo timbers swamped at its head, valued at Sa. Rs. (80,000) very few of which he ever recovered. These timbers blocked up the Navigation in the Dry Season of 1819, and many people are of opinion, that they were the foundation of all the evils which have been subsequently experienced.

4. It is difficult to assign with precision a cause for these variations, but the extraordinary changes which annually occur in the Ganges, will in most instances account for them. Some seasons [a] sand bank may be accidentally deposited in such a situation as to turn an additional quantity of water into a River; in other seasons, quite the contrary, or perhaps so as to block it up altogether.

5. Some measures have, I am aware, been taken for the improvement of both the Jellinghee and Bhagaritthe Rivers, but I am not sufficiently acquainted with their nature and extent to offer any remarks upon them here. The plan adopted in the Matabangah for removing partial accumulations of sand in particular spots of its course, has been by confining the stream with (what the Natives term) Bandells, which are constructed by driving rows of pointed Bamboos, Babul tree posts (from 8 to 10 feet long) two or three cubits firmly into the sand, and about one foot asunder, obliquely across the channel, or in whatever direction is best calculated to accomplish the above object. The Babul tree posts, &c. are likewise propped up behind with long bamboos, and faced with mats, or jamps, fastened to them with twine. By this simple process the part obstructed is always, in a few hours, sufficiently deepened to admit boats of large burthen to get over it; the sand, causing the obstacle, being, by the increased velocity of the current, swept away, and deposited in the deep pools, or thrown to one side of the passage. Bandles are, however, sometimes unavoidably attended with a considerable deal of trouble and expense, although when judiciously put up they are exceedingly useful The expense incurred for constructing Bandells in the Matabangah River, in—

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| December, 1820, was, .. .. .. Sa. Rs. | 679 | 5 | 10 | | | |
| Ditto ditto, in the year 1821, .. .. .. | 209 | 12 | 6 | | | |
| Ditto ditto, up to the 1st of May 1822, .. .. | 214 | 1 | 3 | | | |
| | | | | 1,103 | 3 | 7 |
| For removing sunken boats from its bed in June, 1820, was, .. .. .. .. .. Sa. Rs | 8 | 10 | 6 | | | |
| Ditto ditto, in the year 1821, .. .. .. | 28 | 1 | 6 | | | |
| Ditto ditto, up to the 1st of May 1822, .. .. .. | 38 | 5 | 2 | | | |
| | | | | 75 | 1 | 2 |
| For removing sunken trees from its bed in June, 1820, was, .. .. .. .. .. Sa. Rs. | 36 | 15 | 0 | | | |
| Ditto ditto, in year 1821, .. .. .. . .. | 55 | 12 | 3 | | | |
| Ditto ditto, up to the 1st of May 1822, .. .. .. | 17 | 12 | 5 | | | |
| | | | | 110 | 7 | 8 |
| For removing sunken timbers from its bed in December, 1820, was, .. .. .. .. .. Sa. Rs. | 107 | 2 | 5 | | | |
| Ditto ditto, in the year 1821, .. .. .. | 13 | 8 | 0 | | | |
| | | | | 120 | 10 | 5 |
| Carried over .. .. .. .. .. | | | | 1,409 | 6 | 10 |

| | Rs. | a. | p. |
|---|---|---|---|
| Brought over, ... . . .. | 1,409 | 6 | 10 |
| For deepening different parts of its channel with Kodalees in 1821, was, .. .. .. .. .. Sa. Rs. | 159 | 12 | 8 |
| For removing trees from its banks which were likely to fall into the stream, in May 1820, was, .... Sa. Rs. . . . .. | 66 | 4 | 8 |
| Two Canals have been cut for the purpose of improving the Navigation of the Matabangah River in the vicinity of Katchikottah, and a Caisson sunk, filled with bricks, together with a number of old boats filled with earth, across the mouth of the Como, in order to raise the bed of that river at its point of separation from the former; as a minute detail, however, of the nature, extent, and effects of these measures might perhaps exceed the limits of this paper, I beg leave to refer the Committee to Paragraphs Nos. 5, 6, 7, 9, 10, and 11, of the accompanying letter, for farther information respecting them, and shall here only notice that the | | | |
| Total amount expended upon the excavation of the first Canal, (which was commenced by my predecessor Mr. Robinson, in the end of March, 1820, and furnished [finished] by myself in June, 1821) immediately above the village of Neemtollah, was, .. . .. .. Sa. Rs. | 4,863 | 2 | 2 |
| That, upon the excavation of the second Canal, commenced in March 1821, and completed in April last, near the village of Gwalberriah, the total amount expended was, .. .. .. .. .. Sa. Rs. | 10,508 | 13 | 2 |
| And that upon the works for partially shutting up the mouth of the Como River, executed during the months of May and June 1821, the Total amount expended was, .. .. .. .. Sa Rs | 2,800 | 14 | 3 |
| Total .... Sicca Rupees, | 19,808 | 5 | 9 |

As I have already stated in my reply to the foregoing query, that the chief obstructions to the Matabangah, have always existed at or near its head, and with due advertence to the extraordinary changes to which the course of the Ganges is annually subject, the inutility of attempting to open Cuts or Canals from it into the former River, with the prospect of yielding any lasting benefit to its navigation, will I think appear obvious, without farther explanation. I have therefore no hesitation in asserting from all I have been able to observe, that the only means (in as far as I am competent to judge) which can ever be resorted to with a reasonable hope of remedying the evils in question, will be Dredging Machinery, worked by steam engine, and fitted up upon Boats so constructed as to draw very little water. Indeed I will venture to affirm, that if two Dredging Machines of 20 horse power, were skilfully applied at the head of the Matabangah River during the proper Seasons, that they could be perfectly capable of keeping its whole course navigable for boats of 500 Maunds and upwards, throughout the year Two such machines would raise 1,200 tons of sand per day from the bed of the Canal, and the cost of them complete, would not, I suppose, exceed Sa Rs. 80,000, including the expense of building the necessary boats in this country, and of bringing the steam engines, &c. out from Britain.

The period usually taken up by laden boats of 600 Maunds burthen in proceeding

from *Calcutta* to the Ganges by the Matabangah river, may be estimated from the month of January to July, at about 13 days, and from July to January at 17 or 18 days. In passing from the Ganges to the Hoogly from the month of January to July, at about 9 days, and from July to January at 5 or 6 days,—Laden Boats of the above size generally take in proceeding from Calcutta to the Ganges by the Jellinghee River, from the month of July about 17 days, and from July to January 19 or 20 days, and in passing from the Ganges to the Hoogly, from the months of January to July, about 10 days, and from July to January 6 or 7 days. In proceeding from Calcutta to the Ganges by the Bhaugritty River, the length of the passage for Boats of the same description is commonly from the months of January to July 19 or 20 days, and from July to January about 24 days, and in passing from the Ganges to the Hoogly from January to July 11 or 12 days, and from July to January about 8 days.

8. I am informed that no greater detention for Merchandize of any description has ever taken place, than what arose from the difference of the length of the Sunderbund Route and that of the Matabangah, Bhaugaritthee, or Jullinghee Rivers, as while these were not available, all boats proceeded by the Sunderbund passage: delay has therefore only occurred when boats have unwarily entered the above Rivers while there was not a sufficient depth of water to admit of their getting through them.

9. Answered above.

10. In the month of January 1819, 20, and 21, the depth of water at the head of the Matabangah River has been generally from 3 to 4 feet, in February from $1\frac{1}{2}$ to 2 feet, and in March and April, from 1 foot to $1\frac{1}{2}$. In January last, there were $6\frac{1}{2}$ feet across its head, in February $4\frac{1}{2}$ feet, in March $3\frac{1}{2}$ feet, and in April 3 feet, which at this date* is the least depth in the shallowest part of its course. During the months of January, February, March, and April, 1818, 19, 20, and 21, there was scarce one foot of water across the head of the Jellinghee River; in January last there were 18 feet in it; and just now there are 6 feet. I cannot however, state positively the depth of water which was at the head of the Bhaugaritthee river in 1818, 19, and 20, but I believe in the months of January, February, March, and April, it did not materially exceed a cubit; at present† there is about as much; and in the month of April, 1821, there were 3 feet.

* 1st of May, 1822.

† Ibid.

11. I understand the Bhaugaritty is this year obstructed at, and for a very considerable distance below its head, by sand thrown into it from the Great River during the past inundation, and although the Jellinghee River is not obstructed where it emerges from the Ganges, there are about 2 miles below its entrance several shoals, over which there are only at this time‡ 2 feet of water; there are no obstructions at the head of the Matabangah (at least Boats of 500 Maunds) can now navigate it without difficulty.

‡ Ibid.

12. Dredging Machinery (vide reply) to Query No. 6.

13. The Beds of these Rivers are subject to changes, those I have had opportunities of observing in that of the Matabangah, have been very considerable; the annual encroachment of the stream upon certain spots of its banks, has varied from 100 to 600 feet, but only to the latter extent where the banks were composed entirely of sand, and acted upon by a very rapid current.

14. All changes in the Ganges must undoubtedly have more or less influence upon the Rivers that strike off from it; and as the Committee may be desirous of gaining a correct knowledge of those which I myself have witnessed occur in the immediate vicinity

of the mouths of the Matabangah and Jullinghee Rivers during the inundations of 1820, and 21; a short description of them will be found in the 14th and 15th Paragraphs of the letter herewith sent.

15. None that I am aware of, excepting those I have already mentioned in reply to the 6th Query.

16. The causes are generally referable to the annual variations of the current in the Ganges—some years it may desert the side altogether from which any particular River branches off, thereby rendering its head almost dry; and in other seasons the stream, from some alteration in the opposite bank, may be deflected in a contrary direction, this latter change sometimes is, and sometimes is not, beneficial to the recipient channel, as great bodies of sand are very liable in consequence to be thrown into it.

17. I understand from the reports of several intelligent Natives that the Navigation of the Ganges is not peculiarly dangerous between Bogwangollah and the mouth of the Gurroy at Kooste; and that the wrecks which annually occur are not more numerous in that portion of its course, than in any other of equal extent above Bogwangollah; but I have been unable to ascertain the amount of the losses sustained during the months referred to.

18. I cannot answer this question: some correct information however on the subject might be obtained from the River Insurance Company in Calcutta.

19. I have no means of resolving this Query; but I should suppose the River Insurance Company may be able to do so.

20 I can furnish, if necessary, a Statement of the number of Boats, and their tonnage in maunds, which have proceeded to the Upper Provinces in the years 1820, and 21, by the Matabangah; but no record has been kept in the Office of those boats passing up or down which are, or are not, insured in Calcutta.

21. In the year 1820 one boat was lost; in 1821, two; and this year, up to the present date, one boat; all these boats were swamped by the carelessness of the people in charge of them, and not from coming in contact with any obstructions in the Matabangah River.

22. I am unable to reply to this question, but the River Insurance Company possibly can

23. I am not aware what number of Boats are lost annually by this route; but I should think the amount of losses must be greater in the Jullinghee River than in the Matabangah; no attention having ever been paid to the removal of large trees from its banks, which are continually falling into the stream during the inundation, and which prove dangerous in the extreme to all boats navigating it at that period.

24. The usual period of a passage, I understand, in the Rainy Season, from Calcutta to the Ganges by the Sunderbunds, is 7 weeks; and from the Ganges to Calcutta 3 weeks In the Dry Season the time taken up from the Ganges to Calcutta is 4 weeks; and from Calcutta to the Ganges 5 weeks.

25. I have made much inquiry on this point from many respectable Natives, and the most general opinion is, that the Jullinghee River has never within the last 20 years been navigable in the Dry Season for boats of 500 maunds,—but I could not ascertain the years and months during the period specified, in which the Bhagaritthe was closed to boats of that size. It was free for such boats last year, to the end of June. The Matabangah was open for boats of from 500 to 1,000 maunds throughout the years 1809, 10, 11, 12, 13, 14, 15, 16, 17, and 18, and is* now passable for boats of 500 maunds. and upwards.

* 1st M

26. The Calcully River emerges from the Ganges a short distance South of Bhogwangollah, and empties itself into the Jullinghee River about 5 miles below its present entrance; but I am credibly informed that it is only passable for laden boats during the inundation, and that its head is annually obstructed with sand thrown into it by the Great River.

27. Answered above.

(*Signed*) JOHN S. MAY,
*Sup. and Collector of Nuddiah Rivers.*

DEWANGUNGE,
1*st May*, 1822

# E 42. *c.*

(1) Paper E para. 6.

[1]List, **No. 5.**

(2) Paper E para. 39.

[2] I am not sufficiently acquainted with the nature and extent of the Trade under the influence of the Navigation to the Eastern Provinces, duly to appreciate the advantages which will undoubtedly arise to it from the execution of Lieutenant Schalch's Scheme, but I think it will appear obvious, to the most cursory observer, when the safety which the proposed navigation holds out for the transportation of all the articles of commerce, is contrasted with the delay, uncertainty, and risk, attending the present circuitous passage, that its adoption must prove highly beneficial to Government, and the Mercantile Community at large.

2. The advantages which are likely to result to the Trade with the Western Provinces from the formation of the Canals in question, do not appear to me of so much importance; the Navigation by them will certainly be safer and shorter than the existing one through the Sunderbunds, but the new line of communication will never be resorted to, from choice, by Up-country Boats, while either of the direct routes is available; and it yet remains to be proved whether some one or other of the three may not be rendered so during the Dry Season, by the aid of powerful Dredging Machinery.

10. A Statement containing the description of the Goods, and the tonnage of the Boats in which they were conveyed down the Matabangah to Calcutta, and from Calcutta upwards to the Ganges, from the month of May 1820, up to the 30th of April last, inclusive, can be furnished, if necessary, from the records of this Office; but I have no means of ascertaining the quantity of the Goods laden on each Boat, as the Toll Duty is levied upon the *burthen* of all Boats, at the rate per 100 maunds, proportionate to the value of the Cargo they carry.

11. Answered above.

(*Signed*) JOHN S. MAY,
*Sup. and Collector of Nuddiah Rivers.*

DEWANGUNGE,
1*st May*, 1822.

# E 43.

(1) Paper E. para. 6.

To MAJOR FAITHFULL.

*Secretary to the Special Committee for Lieutenant Schalch's Plans.*

Lottery Committee.

SIR,

I am instructed by the Lottery Committee to forward the following Replies to the several Queries contained in your address to them of the 29th March 1821.

1. With regard to the First Query, the Committee are of opinion that the Town to the West of Cossitollah and Chitpore Roads, should be drained into the (2) River, and that part of it to the East of those Roads, into the Circular Road. The Committee are further confirmed in their opinion, from the experience derived from the present Drainage of Court-House Street, and between that and the River, where the Drainage is carried on by Tunnels into the River.

(2) Paper E. para. 17.

2. In reply to Second Query, the Committee observe, that no damage has ever arisen from the method adverted to in this Query.

3. (3) The Committee are of opinion that both the objections stated in the Third Query would occur to the Plan suggested by Lieutenant Schalch.

(3) Paper E. para. 18.

4. With reference to the Fourth Query, the Committee observe, that the force of the water would probably be sufficient to carry the filth into the Canals, but then a considerable deposit must and would take place, and thereby occasion the nuisance adverted to in the foregoing reply.

5. When the size of the Tunnels proposed in the Fifth Query are determined on, the calculation can easily be made—the cost will doubtless be very heavy; the Committee conceive the work to be of the highest importance to the cleanliness of the City and the health of its Inhabitants.

6. The Committee are of opinion that if the proposition in the Sixth Query were to be carried into execution, the result would not be favorable; and that there would not be a sufficient strength or rapidity of water to prevent the deposition in the Canal.

7. To Query the Seventh, the Committee reply, that the effect would be the same as is experienced at present in the Ditches, but no further injury is likely to occur, nor any danger of an inundation to the Town.

8. The Committee are not aware of any obstacles to the Canal being cut as proposed in the Eighth Query.

9. (4) In reply to the Ninth Query, the Committee remark, that understanding the Drain is to be made on the Eastern side of the Ditch, which at present supplies the lands about Dum-Dum with water, the supply will consequently remain the same after the Canal is opened.

(4) Paper E. para. 20.

10 The following is the average value per Cottah, as required in the Tenth Query.

(1) Paper E para 20

| | | per. 1,000 feet. | 1 to 2,000 feet |
|---|---|---|---|
| From Eastern Canal | to Baleaghatta Road. .. .. .. .. .. | 100 | 50 |
| | to Soora Road, .. .. .. .. .. | 50 | 25 |
| | to Maniktollah, .. .. .. .. .. .. | 40 | 20 |
| | to Halseebaugan, .. .. .. .. .. | 32 | 16 |
| | to Sambazar, .. .. .. .. .. .. | 50 | 25 |
| | to Chitpore, .. .. .. .. .. | 100 | 50 |

And there is little doubt, the Committee think, but that the value could be doubled.

(2) Paper E para

11 (2) The Rate of Tank-digging required in Query Eleventh, is as follows

| | | | | |
|---|---|---|---|---|
| 1st. Chowkah. .. .. .. | 1 | 0 | 0 | Rupee. |
| 2nd. Ditto, .. .. .. .. | 1 | 8 | 0 | |
| 3rd. Ditto, .. .. .. .. .. | 2 | 4 | 0 | |
| 4th Ditto. .. .. .. .. | 3 | 6 | 0 | |

and the earth excavated to be distributed 50 feet on the sides

12. The Committee feel they cannot give a satisfactory reply to Query the Twelfth, but they think that, if free of Toll, Boats would frequent the Bason at all Seasons, but would pay a moderate [Toll] to discharge or load during the floods—particularly such as contain Cotton, Grain, and Salt* Boats; a reference to the Customs Department would probably be productive of a more satisfactory reply to this Query.

* Sic. in Original, J. M

13 The Committee are unable to reply to Query Thirteenth, but they furnish a Statement arising from their knowledge of the Stratas of earth ascertained in digging Tanks at Short's Bazar and Tuntunee.

SHORT'S BAZAR

From surface to 13 feet, Sandy Clay.
From 15 [13] to 18, Fine Sand.
From 18 to 24, Blue clay and vegetable matter.
From 24 to 26, Peal. [Peat]
From 26 to 36, Sandy Clay.

TUNTUNEE.

Surface to 10 feet, Sandy.
From 10 to 18, Mixed soil.
From 18 to 32, Clayish.
From 32 to 36, Peal. [Peat]

14. By order of the Committee, I have the honor to forward to you the Table of Levels of Calcutta and its vicinity, as taken by Lieutenant Schalch, and have the honor, &c.

*(Signed)* J. B. BARLOW,
*Actg. Secretary Lottery Committee.*

CALCUTTA,
*The 27th May*, 1822.

## (1) E 44.

(1) Paper E. para. 6.

To MAJOR H. FAITHFULL,

*Secretary to the Special Committee on Lieutenant Schalch's Plans.*

Sir,

Various circumstances have hitherto prevented my replying to your letters of the 18th December and 4th May last, I now however, have prepared answers to the Committee's Queries according to the best of my abilities, and do myself the pleasure of enclosing them.

2. My opinion with regard to the feasibility of Lieutenant Schalch's project is so fully expressed in these answers, that it is unnecessary for me to say more on the subject here. I wish, however, the Committee to understand that my judgment has chiefly been formed upon an observation of the Soonderbuns to the Westward of the Juboonah, and that I have little or no acquaintance with the country to the East of that River.

3. The accompanying specimens of earths, and copy of a Bengallee petition are referred to in the replies.

I am, &c.

(*Signed*) D. DALE,
*Commissioner.*

Soonderbuns,
*Commissioner's Office,*
*The* 31*st May,* 1822.

## (2) E 44. *a.*

(2) Paper E. para. 11

List **No. 3.**

1. The Question as to the practicability of merely cutting the Canal at those parts where the courses of existing streams are abandoned, or improving the channels of the latter, may, I conceive, be easily decided where money and power are placed at the disposal of ability and enterprize; after it has been made, I am not aware of any reason why it should not remain, or at least be easily kept, uninterruptedly navigable: for, instead of occupying the bed of those Rivers in which Sand abounds, it will, in most cases, intersect them at right angles, and, consequently, be little influenced thereby; small banks may occasionally be formed where tides flowing in contrary directions, usually meet, as has happened in Goodlad's Creek, Seeoolee Khal &c.—but these may, at different periods, be removed with very little difficulty. I should, however, apprehend considerable inconvenience from the frequent change of tides in the Canal, as the water in it will be equally affected by each of the numerous petty streams which it must cross,—while the Altara Banka, Kaleegatchy, and Koolea are only influenced by the tides of the Roymungul and Amjara. In travelling from Bussera to Tardah by the Kumerjole River, the Seeoolee and Bhoda Khals and the Tumboolda, I required, I believe, seven different tides—whereas had I gone at once into the Altara Banka, and thence by the usual route, no more than two would have been necessary.

2. I am not acquainted with any Streams whose channels have been filled up by depositions of mud, which is of so light and dissoluble a nature, that it must always be kept in suspension, and eventually be carried off by the water, unless its current should in any case be suddenly checked or impeded—obstructions by the deposit of Sand, which is of greater specific gravity, are much more frequent, as in the cases of the Bhugeerutti, the Mathabhanga, and the Jellinghy. I have already mentioned the sand bank, occasioned by the meeting of the flood tides flowing in opposite directions from the Juboona and Baustullah Khal, which has been formed in Goodlad's Creek; besides this, I understand that it is very shallow throughout—but am not aware whether it has recently become so in consequence of depositions of mud or sand, or whether it was originally of small depth.

* Sic. in Original, J. M.

Morrieson's Cut is quite free from all obstructions, on the* contrary, it has considerably increased in depth since its original excavation.

3. In navigating the various Rivers of the Sunderbuns, in all of which the tides regularly ebb and flow, I have never met with any whose banks seemed to be suffering, or to have, at a former period, undergone any considerable change from this cause; but there are few Streams of any magnitude, into which the tides do not enter, or in which the effect of the tides is overcome by the velocity of the current, whose banks are not worn down or undermined in different places by the violence of the stream; specially during, or immediately subsequent to the rainy season.

(1) Paper E. para. 27.

4.(1) I am inclined to believe that the proposed Canal will not have any material effect in increasing the Cultivation of the Sunderbuns, if it has not an opposite tendency—for we do not find that the mere vicinity of a water communication is sufficient for the inducement of individuals to settle upon or commence the Cultivation of a Jungly Tract; no attempt having as yet been made to clear any part of the banks of the Altara Banka, Kaleegutchee, and Koolea, which is the most frequented route to the Northern Provinces, as well as to the Eastward. Even within a very short distance of Calcutta, we may observe that both banks of Tolly's Nullah, and the Cut which leads from Tardah to the Salt Water Lake, are covered with Jungle for a distance of 3 or 4 miles; viewing the matter however, in another light, I much fear that the Canal, by introducing Salt Water into those parts of the country, which it does not now† approach, would materially injure the cultivation—as has actually been the case with Morrieson's Cut. Before that was made, the Salt Water which would otherwise have flown [flowed] up with the Tide through the Kalinda or Juboona Rivers, was kept back by the stream of fresh water coming down the Issamutty, and consequently the water in all these Rivers used, except during the two hottest months of the year, to be fit for domestic and culinary purposes so far as ten or fifteen miles below Bussunthpoor. In the Colea, however, no such check is given to the flood tides, it therefore flowed, and still flows perfectly salt to its utmost range; this Salt Water formed a passage through Morrieson's Cut, and the effect has been, that for miles *above* Bussunthpoor the water of the Issamutty has become impregnated with Salt; and below that point many villages have been either totally or partially reduced to a state of Jungle, and abandoned by their former Inhabitants. Some years ago a

(2)Paper E. para. 29.

†NOTE.—The part of the country(2) alluded to by Mr. Dale is equally with the other Sunderbuns Tracts inundated during the prevalence of the Spring Tides to a depth generally of a Foot; the cause of the Inundation is the overflow of the Tides in the numerous Streams which intersect the country, and which communicate freely with the Sea, consequently no additional body of Salt Water will be introduced by excavating the Canal in question, as it connects the above Streams laterally, or at right angles to the direction of their current.

As the Salt Water flowed into the Jubboonah above Morrieson's Cut by the old passage through the Sunderbuns the opening of that passage could not have been the cause of injury to the cultivation.

I made particular inquiries at the place itself, and at Baugundie, from which it

junction was made between one of the back channels of the Sunderbuns and Issamutty by a Canal dug at the expense of a Native, which entered the latter Stream at Husseenabad, the very spot at which Mr. Schalch's Canal is to leave it ; but similar results were apprehended and [it] was speedily shut up.* However the danger which is anticipated might perhaps be prevented by embankments thrown up by the individual to whom the excavation of the Canal would be entrusted, or some other skilful Officer appointed by the Government ; I nevertheless enclose the copy of a petition† on this subject, presented to me by about sixty or seventy individuals from those parts of the country through which it is proposed to carry the Canal.

5. In those parts of the tract which are under Jungle, the land may, I doubt not, be taken without the payment of any price ; in other parts of the Mufussil it will I believe be found to average[(1)] about eight annas per Cottah, but in the neighbourhood of Calcutta, that is, from Balliaghaut to Chitpore, it must of course greatly exceed that rate, perhaps a hundred-fold, or even more.

6. Labourers, of the description required, are, I believe, not very plentiful in the Jessore District ; but three or four hundred men might be collected ; they are generally paid at the rate of 3/8 or 4 Rs. a month.

7. Contracts for Tank digging,[(2)] in the Jessore District, are usually made for the cube of $7\frac{1}{2}$ feet ; for the first of these the charge is from 1/4 to 1/8 ; for the second, from 1/14 to 2/4 ; and for the third from 2/8 to 3 Rupees, that is, the charges for the cubes in the first, second, and third Strata are in the proportion of 2, 3, and 4.

8. Inquiries at different places afforded me different results ; one made in the immediate neighbourhood of Calcutta, gives the following,—from the surface to 17 feet, sand, from 17 to $21\frac{1}{4}$ feet, a whitish chalky clay ; from $21\frac{1}{4}$ to $23\frac{3}{4}$ feet, a black hard sort of clay ; from $23\frac{3}{4}$ to $27\frac{3}{4}$ feet, white clay, firmer than the kind above mentioned ; and from $27\frac{3}{4}$ to $29\frac{1}{2}$ feet, black earth. By another made at Dooleeapoor, formerly belonging to the Nuddeah District, we have from the surface to 5 feet, sandy earth ; from 5 to 7 feet, sand ; from 7 to 12 feet, white clay ; from 12 to 16 feet, hard black ditto ; from 16 to 20 feet, ditto white Ditto ; and from 20 to 26, strong black earth, or decayed vegetable matter—specimen's of each kind are forwarded herewith : water was in the first case found at the depth of 15, and in the second at the depth of about 30 feet from the surface.

9. The number of Boats annually lost between the two places mentioned in the Query, is very considerable, as the quantity of wrecks found at various places, as well as the testimony of Manjhees accustomed to traverse those parts, abundantly prove, but their total number cannot be ascertained with any degree of accuracy. Fewer accidents would I imagine happen, were Lieutenant Schalch's project carried into execution, but still it would be vain to expect that his Canal should remain free from obstructions of this kind ; for even [(3)] Tolly's Nullah abounds in Boats, which have probably in most instances sunk from their decayed and rotten state, although many boats go down in consequence of striking against each other, or the piers of the bridges under which they have to pass.

10. I understand that losses, occasioned by storms and severe weather, most frequently occur at the junction of the Burro Koolea and Roymungul, where there is a pretty

appears that the cultivation of the land alluded to had been relinquished in consequence of the exorbitant exactions of the Zumeendars. As a proof that the proximity of Salt Water Streams does not forbid the cultivation of the adjacent land, it may be mentioned, that there is a large Tract immediately to the West of Husseenabad, which is now in a high state of cultivation, although the streams of the above description flow through it in every direction.

(*Signed.*) J. A. SCHALCH.

* Note.—This is still open, I went down it in a large 14 oared Budjoro last year.

(*Signed.*) J. A. SCHALCH.

† Note.—Mr. Burney when at Baugundie had a petition presented to him by a number of Merchants in his neighbourhood to open a passage to Calcutta, at the head of the Sunderbuns, in consequence of which an Officer was sent to examine the Juboona Creek, to ascertain whether it could be appropriated to the purpose. He showed my Plans to many natives at that place, who highly approved of them.

(*Signed.*) J. A. SCHALCH.

(1) Paper E para 52.
(2) Paper E. para. 50.
(3) Paper E. para. 20.

considerable sandbank, and several wrecks upon it, but I am not prepared to state the proportion which those sustained at that point may bear to the total number ; many boats have likewise sunk in the Koolea in consequence of striking upon trees which have fallen into the stream and remain concealed by the water ; and I am also informed, that losses are not unfrequently experienced in the Doputdanga Jheel, from unskilful Manghees allowing the tide to Ebb from under their Boats, which if not very strong, at once go to pieces, and in other cases sink so deep into the sand, that the rising tide is unable to float them again.

10½ I am not of opinion that robberies are of very frequent occurrence in the Soonderbuns; nor do I think they are to be apprehended at any particular places; although the Rivers Kalagatchy, Roymungul, and Seebshah, might perhaps be named: I cannot state the number which have taken place during the last five years, but I believe they have chiefly been committed on Salt boats, by persons connected with the Smugglers.

11. The length of time usually occupied in travelling between Calcutta and Koolna is pretty nearly according to the following table:—

| | | |
|---|---|---|
| In February, March, and April. .. | 10 | Days |
| In May and June, .. .. .. | 12 | |
| In July and August, .. .. .. | 11 | |
| In September, .. .. .. .. | 10 | |
| In October, .. .. .. .. | 9 | |
| In Nov. Dec. and January, .. .. | 8 | |

12. The point at which detentions most frequently occur. seems to be the junction of the Coolea and Roymungul Rivers; but they likewise happen at Bussunthpoor on the Juboona; Taika on the Cobudduk, at the junction of the Minus with the Seebshah; of that River with the Bhudder; and at Butusspore on the Pussar. Boatmen however are in the habit of coming to at any appearance of a North-wester wherever they may happen at the time to be. The period to which delays extend cannot be correctly ascertained—but boats are occasionally kept at the mouth of the Roymungul for five or six days, this generally happens in the months of March, April, May, and June.

13. I am not aware of any advantages which the communication at the (1) back of the Circular Road would possess over that by (2) Tolly's Nullah ; were the latter sufficient for the present intercourse ; it is however so utterly inadequate to its object, as to be often completely choaked with boats from Khidderpoor to Russapugly; and again for about two or three miles beyond Guriahaut. It is moreover so shallow as to be impassable at low water for boats of very light burthen, nor can its dimensions be augmented without incurring an expense nearly equal to what would be requisite for cutting a new Canal, owing to the earth originally excavated from it having been thrown up immediately upon its banks; on this account therefore the proposed communication would be very beneficial. There is another circumstance connected with Tolly's Nullah, which certainly does not come within the scope of the Committee's Inquiries, but is so great a nuisance as to deserve notice in this place, I mean the number of human bodies which are constantly burnt, and Sutties which take place upon its banks. This, in so small a Stream, could not fail to be very offensive, in fact it is so great an evil, that I am certain no gentleman aware of its extent, and possessing ordinary nerves, would ever travel by that route when he could make choice of another. The half-burnt bodies are frequently seen floating down the Stream, or stopt in their progress by the boats.

(1) Paper E. para. 19.
(2) Paper E. para. 44.

14. The adoption of Lieutenant Schalch's route would tend in a great degree to remove the aversion of boatmen to the Sunderbund Navigation; for, independent of the saving in distance, it would relieve them from the apprehension of robbers and wild beasts, as well as from the danger of being wrecked upon sand banks, sunken trees, boats, &c. It would also allow them more frequent opportunities of supplying themselves with fresh water and provisions, and enable them, in most cases, to dress and eat their victuals on shore, which is of great importance to a Hindoo.

15. I cannot answer any part of this question, as far as it relates to[1] Goodlad's Creek with any degree of precision; nor am I aware of the expense incurred in making Morrieson's Cut. The original dimensions however of the latter were, I believe, length 300 feet, breadth 100 feet, depth 30 feet. It required 2 months of one year to clear the ground from Jungul, and three months of another to excavate the Canal. I understand that Goodlad's Creek was dug, for about four miles, to the breadth of forty, and the depth of fifteen feet; but it was cut in the bed of a Khal, which originally existed there.

(1) Paper E. para. 12.

16. I have already given the original dimensions of [2] Morrieson's Cut; its present breadth is 190 and its depth 60 feet. There are still some remains of the earth which was thrown up on its Northern bank, but its Southern bank has been a good deal broken away. However, this increase in the magnitude of the Canal was no doubt anticipated, or rather intended, by Captain Morrieson, who of course would not put himself to the trouble and expense of cutting it to the entire necessary dimensions, when he foresaw that it would soon be sufficiently enlarged by the water itself. Its breadth does not appear to be now augmenting. I am unable to give any further information with regard to Goodlad s Creek.

(2) Ibid.

17. No sums of money have ever been expended in the repair of the Canals in question; nor is it likely ever to be requisite with regard to Morrieson's Cut: Goodlad's Creek requires deepening.

18, 19, 20, and 21. I am incapable of replying to these Queries.

22. The usual period is in the Months of

| | | |
|---|---|---|
| February and March, | 13 | Days |
| In May and June, | 15 | ditto. |
| In July and August, | 14 | ditto. |
| In September, | 13 | ditto. |
| In October, | 12 | ditto. |
| In Nov. Dec. and Jan. | 11 | ditto. |

23. The causes detailed certainly tend to increase the freight of boats navigated through the Sunderbunds, but I don't think that Mangees and Dandies would, in *general*, absolutely refuse to traverse those tracts where a higher rate of remuneration is offered; nevertheless when I had occasion to engage boats for my own accommodation in the Sunderbuns, several persons who were before willing to give them on hire and accompany me, declined doing so on knowing my destination.

24. I am not in possession of any materials upon which I could found an answer to this Question.

25. It would certainly diminish the rate of Freight and Insurance, but it is not very easy to say the extent to which such reduction might take place; I should think however, that it ought to be at least equal to 25 per cent. on the ordinary rates between Calcutta and Koolna; for the journey would be performed in a much shorter

period than is now required; the Boats and Cargo would be exposed to less danger, and the boatmen subjected to less inconvenience and apprehension than they are liable to in travelling by the present route.

26. The Committee will find in my answer to their 12th question all the information I can give on this subject.

27. Boats once arrived at the mouths of these Rivers would, by proceeding through them, reach Calcutta much quicker than they could do by choosing the Koolna route. It might therefore be advantageous to await their opening *for a few days,* but I do not think Mangees would remain in expectation of that circumstance in preference to proceeding by the proposed Canal, when no saving in point of time could be thereby effected.

28. The formation of a Harbour of the description proposed would be attended with various advantages; the chief of which are the protection it would afford against the storms so frequent between the months of March and July, and the facility which boats would experience in loading and unloading—but if this Harbour is to be the only communication between the Canal and the Houghly, care should be taken that it is not entirely blocked up by boats so employed.

(*Signed*) D. DALE,
*Commissioner.*

SOONDERBUNDS,
*Commissioner's Office,*
*The 31st May,* 1822.

(1) Paper E. para. 28.

## (1) E 44. *b.*

## *Translation of a Petition made to the Commissioner of the Soonderbunds by the Zemindars, Talookdars, Ryots, and Inhabitants of Purgunnah Augurparah, Myhutty, Baleeah, Boorun, Noornagur, and Nakur, &c. dated the 29th of Chyte,* 1228 *B. S. corresponding with the* 10*th April,* 1822.

That on the 23rd of January 1822 a Purwannah has been issued upon Byrabchunder Roy, the Canango of Purgunnah Augurparah, &c. requiring the particulars of a proposed Khal be dug out adjoining from the River Roopsah below at Khoolna to the Hooghly River at Chitpore, to pass the Boats directly, instead of turning round Soonderbunds River, which is generally the passage of Boats.

But for the proposed Khal on the West of the Issamutty and Jumna Rivers there is a village called Haslabad, all of its high ground and the grounds its vicinity shall be cut down for to adjoin the proposed Khal to the River Biddadhurry, a Salt Water River, its being so dug out through our Inhabitants and Milkeeats, to which we formerly enjoy shall be entirely injured, therefore as for the undermentioned expianations will make you belief the case.

1. North from Baleeah, South to Dumdumah is almost 12 hours way, we reside on two sides, East and West, of the Issamutty and Jumna Rivers, and we use its water, no Tank may be dug out in these places, because the earth is of Sandy, but if when any one begun to dig in the course of its not having dug more than 3 or 4 cubits downward the water leaks and be filled in one or two days, also the banks if it break down.

2. Previous to the new passage of the Khal, Mr. Morrieson has been dug out at Khasbas near Tirmohany, and adjoined it to the River called Burra Kooleeah, the Boats were passing through the River Chota Cooleeah, and the tide of Salty water of the River Roymungul was to pass very little into the Issamutty and Jumna, for which the water were good and fit for use, and we was to use the water of Issamutty and Jumna for ever; since the Khal at Khasbas been opened the water of Issamutty and Jumna became salty; the reason of the water of the above Rivers being former times good and useful was, that the Salty Tide water of Roymungul's were not to pass through the Chota Kooleeah into these Rivers, in consequence the tide was to run as far as to Husnabad's bound, yet the water of these Rivers was to be little Salty from the month of Chyte to Assar, for the tide of the River of Roymungul's was to be over flowed into the Issamutty and Jumna, and from the month of Assar to Falgoon the water of these Rivers is good and fit for use; during the above mentioned three months the waters being salty we suffer much hardness for good water; the River of Biddadhury and Khulseekhally is not far way from Husnabad's Salty Nullah, if in adjoining the Husnabad Salty Nullah to Biddadhury through the proposed Khal the water of Issamutty and Jumna will continue be more salty and useless; it is to be observed that by the present state of water of these Rivers about one-sixth part of the Inhabitants suffering illness, otherwise if the new proposed Khal be opened through Husnabad Nullah, then the Inhabitants for wanting of good water shall leave their inhabitations and turn into continue ailment.

3. Before the Khasbas Khal being opened the water of Issamutty and Jumna were good and useful, and the crops on two sides of the bank were growing pretty well, but after its having been opened whilst the Salty water passing into these Rivers, through Noornagur, Nukibpore, &c. and the Westward the Purgunnah Dhooleeapore, Augurparah, and Myhutty, the Ryots of these places reduced to distress in consequence of the crops being growthless every year, especially on the Westward of Purgunnah Dhooleeapore and Noornagore the Inhabitants of these places are deserted from their inhabitations for the reason of not growing the crops, and severe illness on being opened the proposed Khal will be *more* worse for against the Ryots of both sides of the River Issamutty and Jumna for wanting of good water, and shall fell into sick, and the villages will entirely be fled away, leaving their inhabitations—and then the Government will of course sustain the loss of revenue of those places.

4. Your Petitioners having laid all the circumstances before you prior of opening the proposed Khal, in hope through your kindness the whole circumstances of this fact be forwarded to Government for its serious consideration.

| | | | |
|---|---|---|---|
| *(Signed,)* | Bissonauth Roy,<br>Goopeenauth Roy,<br>Cosseenauth Roy, | Talookdars, Purgunnah Augurparah, &c. | |
| | Kistopran Roy, | Ditto, | of Dehee Paltuah Purg. Boorim. |
| | Ramnarain Ghose,<br>Prawnkisto Roy, | Ditto, | Purgunnah Noornagore |

| | | | |
|---|---|---|---|
| *(Signed,)* | Nundkoomar Chowdry,<br>Byrub chunder Chowdry,<br>Parbutty churn Chowdry, | Talookdars, Purgunnah Nukibpore, &c. | |
| | Ramkisto Roy,<br>Ramlochun Roy, | Ditto, | of Dehee Balzeekree &c. |
| | Debnarain Roy,<br>Bhobaneepersaud Roy, | Ditto, | Purgunnah Augurparah. |
| | Kaleecoomar Roy,<br>Besser Roy,<br>Byrubkoomar Roy, | Ditto, | ditto, ditto. |
| | Ramchunder Roy,<br>Manicchunder Roy, | Ditto, | ditto, ditto. |
| | Hurrynarain Ghose, &c. | Ditto, | Purgunnah Myhutty. |
| | Cumlakaunt Roy, &c. | Ditto, | of Dehee Bena Purg. Baleeah |
| | Rajkisto Roy,<br>Cumlakaunt Roy,<br>Jugmohun Roy, &c. | Ditto, | Purgunnah Nyhatty. |
| | Rugoonauth Roy &c. | Ditto, | Purgunnah, Augurparah. |
| | Nidheeram Banderjee, | Ditto, | Russeepore. |
| | Luckkeekanth Mookerjee, | Ditto, | Rajpore. |
| | Ramlochun Roy,<br>Buddeenanth Roy, | Ditto, | Purgunnah Augurparah. |
| | Bissonauth Roy, | Ditto, | ditto, ditto. |
| | Sachuram Banderjee, | Ditto, | of Rutypore. |
| | Razchunder Sadookhan, &c. | Inhabitant | of Khanjeeah Purgunnah Buzilpore. |
| | Eseerchunder Ghosaul, | Ditto, | Purgunnah Dhooleeapore. |
| | Nawazmahomud Sircar, &c. | Ditto, | of Sungrampore Purgunnah Baleeah. |
| | Byrub Mundul,<br>Manick Ghose, | Ditto, | of Sreepore. |
| | Cunuckram Bounerjie, | Inhabitant | of Busseerhat. |
| | Bholy Sirdar, | Ditto, | of Exchyndee Purgunnah Boorun. |
| | Shadoo Sirdar, | Ditto, | of Radanagore. |
| | Myndy, | Ditto, | of Bhatsalah Purgunnah Myhutty. |
| | Gauram Ghose, | Ditto, | of Seebnapore. |
| | Debnath Sircar, | Ditto, | of Callypore. |
| | Chundermony Choudhery, | Ditto, | of Syadpore. |
| | Buddeenauth Ghose, | Ditto, | of Betkattee. |
| | Ramtonoo Banderjee,<br>Ramkoomar Haldar,<br>Debeepersaud Mookerjee,<br>Joynarain Ghose,<br>Attaram Ghose,<br>Ramkonnoy Dutt, | Ditto, | of Takee. |
| | Goluck Ghose, | Ditto, | of Jhawakatty. |
| | Rammohun Ghose, | Ditto. | of Raznagore. |

| | | | |
|---|---|---|---|
| *(Signed)* | Goluckchunder Mundul, | Talookdar | of Auruzpore. |
| | Cheedam Jooghee, Pensoollah Sirdar, &c. | Ditto, | of Burrapore. |
| | Cosseenauth Bose, | Ditto, | of Sreepore. |
| | Daveepersaud Ghose. | Ditto, | of Bettykuttee |
| | Ramchunder Sirdar, | Ditto, | of Diapore. |
| | Bhurutchunder Khur, Byrubchunder Ghose, | Ditto, | of Seerhutty. |
| | Ramjoy Doss, Jugdesser Mundul, | Ditto, | of Haslohbad. |

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## (1)E 45.

(1) Paper E, para. 6.

To CAPTAIN R. C. FAITHFULL,

*Secretary to the Special Committee for Lieutenant Schalch's Plans.*

SIR,

I was duly favored with your letters of the 26th December and 10th January last, with their enclosures.

I am likewise favored with your last letter of the 3rd instant, and beg through your good offices to assure the Committee that I have not been negligent of their wishes, during the long interval that has elapsed; but have been occupied in distributing translated copies of their Questions among the respectable Natives in this neighbourhood—feeling myself wholly unqualified to say any thing useful upon the subject. The replies which I now beg to forward, are principally the result of the Native communications that I have received since; and I have to observe that every thing stated in them refers only to the *Baugruttee*—excepting in one or two instances where the reverse is expressly asserted.

I am, &c.

(*Signed*) H. A. WILLIAMS,
*Comml. Resident.*

JUNGYPORE,
*The 30th May*, 1822.

## (2)E 45 a.

(2) Paper E. para. 32.

List **No. 4.**

1. The Navigation of the Baugruttee formerly remained always open until the year 1797; from that year to 1813, it was closed during the stated five months for boats of more than from 300 to 500 Maunds, which could not pass the mouth at Sooty, but remained in the great River (Ganges), and the Goods were conveyed to, and from, Moorshedabad and Calcutta in boats of from 50 to 100 Maunds burthen. The water in general was not more than five cubits deep, and in some places so little as two or three cubits.

After the year 1813 Government cut a channel to the Eastward of Chapghatty, at Deepchunderpore which restored the Navigation of the Baugruttee all the year round for about seven or eight years. During the last two years the depth of water has diminished by the channel filling up with sand, and boats of a greater burthen than from 200 to 300 Maunds cannot proceed during the greater part of the above mentioned dry months.

2. Of the five months during which the channel was obstructed, the obstruction was greater from March to May, than in the two preceding months of January and February; the depth of water being in those three months only two and three cubits ; the years are stated in the former number, but no record has been kept of each particular year.

3. The outlet of the Baugruttee at Chapghatty, which is called Sooty, is obstructed ;, and the reason is, the weight of the current of the Ganges bears upon the Eastern bank and towards the South, and throws sand on the Western bank, before the Sooty channel, and fills it up to the distance of 2 or 3 coss. A small quantity of water nevertheless finds its way through, and supplies sufficient to keep the Baugruttee in the shallow state mentioned in former numbers. According to the supply of water, boats of larger or smaller burthen proceed. The channel at the following places also is generally much choaked with sand during the five dry Months.

Futtipore, Churha,

Balagatchy, Gyzabad,

The New Cut at Moorshedabad down to the Agurdeep,

Juggernathpore, Moaganparah.

4. The only assignable cause, that I am aware of, for the variations, is the state of the sand at the commencement of the River when it comes from the Ganges. If the current of the Ganges happens to bear upon the Sandbank and cut it away, or a considerable part of it, the channel of the Baughruttee will be longer navigable in proportion to the quantity of sand so cut away. The year in which the channel was first obstructed is stated in No. 1.

5. No private individual, to the best of my knowledge, has made any attempt to keep the Navigation of the Baugruttee open ; Government once did, as stated in answer to No. 1.

6. The Natives think that if the commencement at Sooty can but be kept perfectly open, the rest of the channel would answer, though there might be here and there a difficulty. Of this I cannot speak to the purpose, I can form no estimate of the expense for this object, knowing nothing of the nature of the work, nor can I suggest any remedy for the present evils.

7. In the rainy season the passage downward from the Ganges to Calcutta by the Baugruttee is about eight days, and the return upward about 20 days. In the dry weather the passage up or down is about 15 days on an average.

8. The following articles of commerce have frequently met with detention—Cotton, Tobacco, Rice, and all sorts of Grain, even for three months, March, April, and May—above the commencement of the Baugruttee ; but previously, in January, and February, when the channel was not entirely obstructed, many boats have got through with difficulty, and afterwards stopped at the undermentioned places:—

Moorshedabad and Mangaunparah.

Khoosalpore and Agurdeep.

The number of boats I am unable to ascertain; the Custom House people are most likely to know this; these goods however were conveyed to their destination in smaller boats—only the boats in which they were laden at first were detained, as stated in No. 1.

9. I suppose that the reason for declining the Sunderbund passage is the dread that the Natives in general have of it, as being infested with wild beasts, and having few villages or habitations to afford assistance in case of danger. Besides, the water in many places in Tolly's Nullah is very shallow, causing delay and trouble to the boat and crew, and danger to the cargo.

10. Answered by No. 1—stating the lowest depth as two or three cubits.

11. Answered by No. 4, as far as concerns the Baugruttee.

12. The passage of the Baugruttee has been obstructed from time to time for the last 25 years, as already stated in No. 1, and I am unacquainted with any means of preventing the obstructions; indeed from what Lieutenant Schalch says in his Memoir of their nature and causes, any thing effectual seems to be impracticable, at least for any considerable length of time.

13. This question the Natives express themselves unable to answer; the changes in the neighbourhood of Jungypore, during the time that I have resided at the place (somewhat more than two years) are of no importance.

14. Answered in Nos. 4, and 6; if the current of the Ganges shall bear upon the Western bank at the mouth of the Baugruttee, this last will be navigable during the whole year.

15. I cannot answer this question, as I am absolutely unacquainted with the subject.

16. Answered from the best information I can obtain by No. 4.

17. This question I cannot answer, never having passed between the proposed places. I hear, after various inquiries that I have made, that the River between Bogwangolah and the mouth of the Gurgory, is unusually straight and deep—without any bays, inlets, creeks, or other smaller rivers, for boats to shelter in. The distance is about 60 English miles, which gives great, and often irresistible effect to storms, &c. when they take place. These things, if true, account for the rumour.

18. The Natives estimate that there may be in the rains about 200,000 Boats of all sizes, from 25 to 4,000 Maunds burthen; of these about 75,000 are Merchant Boats, and the rest small craft and pleasure boats; I refer for the dry season of the year to No. 1.

19. By reports from the most intelligent Natives around me, about from 300 to 1,100 boats annually. In a very stormy season perhaps 2,000 boats of all sizes.

20. This is the same question as No. 18.

21. This is the same question as No. 18.

22. This is likewise the same question as No. 18. I only speak of the Baugruttee.

23. The same as No. 19.

24. I never myself went to, or came from Calcutta, by the route of the Sunderbunds, and cannot therefore answer this question. The Natives at this place, whom I have consulted, are likewise unable.

25. In answer to this, I refer to Nos. 1, 2, and 3, for the Baugruttee. But regarding the Jellinghy and Mattahbangah, I am unable to reply. Of particular years no record has been kept; in a country where records are never kept by the Natives upon any subject, that can be of the least utility.

26. The Sooty outlet is the best of the three, in the opinion of the Natives at this

place, and I am not qualified to affirm or deny the assertion. For the Baugruttee I refer to No. 6; it is probable that in the present state of the great River (Ganges) if the sand which obstructs the Sooty mouth were cut away, sufficiently to make the Baugruttee navigable all the year, the Jellinghy and Mattabhangah would undergo very important changes; perhaps their present outlets would be closed with sand.

27. This I am wholly unable to answer, and all the Natives express equal inability.

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(1) Paper E. para. 6

## [1]E 45. *b*.

List, **No. 5.**

1. I am totally unqualified to answer this question; but as far as I have to give an opinion, I should suppose the advantages would be exceedingly great to the whole country.

2. I can only say what I did to the foregoing Question.

(2) Paper E. para. 39.

4. In reply to this [2]Question, I subjoin a statement of the Goods provided during the last 10 years, and of the boats employed, which have only one route from this Factory to Calcutta, by the Baugruttee, on the bank of which the Factory stands.

| Years | | Goods. | Boats. | | |
|---|---|---|---|---|---|
| 1812 | Mds. | 790 | 40 | of from 100 to 200 Maunds. | |
| 1813 | | 1,050 | 53 | Ditto, | ditto, |
| 1814 | | 1,044 | 53 | Ditto, | ditto, |
| 1815 | | 724 | 37 | Ditto, | ditto, |
| 1816 | | 793 | 40 | Ditto, | ditto, |
| 1817 | | 1,100 | 55 | Ditto, | ditto, |
| 1818 | | 1,213 | 61 | Ditto, | ditto, |
| 1819 | | 1,411 | 71 | Ditto, | ditto, |
| 1820 | | 1,378 | 70 | Ditto, | ditto, |
| 1821 | | 1,421 | 60 | Ditto, | ditto, |
| | | 10,924 | 540 | | |

The periods of dispatch are usually four in the year—in the months of January, February, June, and August—sometimes in March, and December; average of each dispatch about 270 Maunds, and 12 boats of the above mentioned burthen.

*(Signed)* H. A. WILLIAMS,
*Comml. Resident.*

JUNGYPORE,
*The* 30*th May*, 1822.

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## (1) E 46. 

(1) Paper E. para 6.

To MAJOR R. C. FAITHFULL,

*Secretary to the Special Committee for digesting Lieutenant Schalch's Plans, Calcutta.*

SIR,

I have the honor to acknowledge the receipt of your letter of the 5th December last and 4th ultimo, with the Plan and other Documents which accompanied them, to which my limited local knowledge of this District has hitherto prevented my replying. Having translated into the Native Languages the Queries which accompanied your letter, I have circulated them to the Canongoe of the Purgunna through which the Canal is to pass, and also to the Zemindars and others who are likely to afford me the information required, and which when obtained, I shall hereafter communicate to the Committee.

I have, &c.

(*Signed*) — MAXWELL,
*Actg. Collector.*

ZILLAH JESSORE,
COLLECTOR'S OFFICE,
*The 3d June,* 1822.

## (2) E 47.

(2) Paper E. para. 6

To CAPT. FAITHFULL,

*Secretary to the Special Committee, Lieutenant Schalch's Plans, Fort William.*

SIR,

I beg leave to return the Lists of Queries which accompanied your letters to my address of the 27th December and 11th January last, and regret that it has not been in my power to collect for you any information, except in reply to the last Question of the second Set, as the Malda district, being on the Eastern bank of the Ganges, is quite distant and distinct from that part of the country to which I conceive the Questions are alone applicable.

I am, &c.

(*Signed*) G. RICHARDSON,
*Actg. Resident.*

MALDA RESIDENCY,
*25th May,* 1822.

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# E 47. *a.*

List, **No. 5.**

4. The annual amount of Tonnage in Maunds employed under this Residency is about 5,000 Maunds. The Boats used are from 100 to 300 Maunds each, according to the Season in which the Dispatch is made, and this is generally every month in the year, except in April and May, when the passage to Calcutta by any route is considered too dangerous, from the frequent storms. The Boats now almost invariably proceed, after quitting the Mahanuddee or Malda River, up the Ganges and down the Bhaguritty, by Sooty and the Hooghly, to Calcutta.

(*Signed*) GEO. RICHARDSON,
*Actg. Resident, Malda Residency*

# (1) E 48.

To MAJOR FAITHFULL,
*Secretary to the Special Committee Lieutenant Schalch's Plans, Calcutta.*

SIR,

I beg leave to apologize for not having earlier answered your letters.

I have now the pleasure of returning the Queries, answered, which you transmitted to me from the Special Committee Lieutenant Schalch's Plans.

I have, &c.

MIRZAPORE, (*Signed*) DAVID TURNBULL.
*2nd June*, 1822

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# E 48. *a.*

List, **No. 6.**

1. In my opinion, the advantages of rendering the Sunderbund passage more speedy and safe, would be great in a mercantile point of view, when the Cossimbazar and Mattabanga Rivers were shut.

2. The extent of value that would be attached to the formation of a Basin or Harbour for Boats near Chitpore, I conceive could only be ascertained by experience, as well as with regard to the number of Boats that would have recourse to it for protection during the months of March, April, and May.

3. As boats would only proceed by any such new passage, when they could not pass the Cossimbazar River or Mattabangah, the per Centage that Goods to and from the Upper Provinces could afford, would, in my opinion, be very small, excepting perhaps on bulky

articles such as Grain, Firewood, Chunam, Timber, and probably Cotton in loose bales, which last article cannot proceed by the Sunderbunds during any period of the year when loaded in the usual way, on large Patellah boats.

4. The Commerce of the City of Calcutta, would certainly be much improved by a more easy Import passage by the Sunderbunds during any period of the year, when the passage by the Cossimbazar and Mattabanga Rivers happened to be shut

5. I have not for many years paid any additional hire for boats proceeding with Goods by the Sunderbunds than by any other Passage to Calcutta; the boats I have generally used for this purpose have been Dacca Pulwars, and they do not seem to incur any particular risk by going by the Sunderbunds: large Patellahs seldom however venture by this passage, and(1) never when loaded with large bulky articles, such as Cotton in loose bales. (1) Paper E. para 1

6. I have had little or no experience as to Export, therefore cannot answer this Question.

7. This Question I think can only be properly answered by a reference to the Imports at the Calcutta Custom House.

8. Ditto, ditto.

9. Ditto, ditto.

10. Ditto, ditto.

(*Signed*) DAVID TURNBULL

## (2)E 49.

(2) Paper E para 1

To CAPTAIN. R. C FAITHFULL,

*Secretary to the Special Committee Lieutenant Schalch's Plans.*

SIR,

I have herewith the honor to return you the List of Queries transmitted to me along with your letter of the 16th of February last, and to express my regret that the little knowledge I possess of the tract in Question, does not allow of my answering them more fully, as I conceive the proposed line of Canals would be of the greatest advantage to the general Commerce of Bengal, though perhaps less so to these Eastern Districts than to any other;—all Boats from this part of the country are for many days in the Megna and Ganges, and we consider the greatest part of the risk over, when they have passed Barisol; still any Plan that could enable them to escape the (3)Roymungle, would be of very considerable benefit, exclusive of the distance saved by the proposed measure. (3) Paper E. para 2

I have, &c.

SYLHET,
14*th June*, 1822.

(*Signed*) HUGH DAVIDSON,
*Captain Comg Sylhet Frontr. Corps.*

# E 49. *a*.

## List No. 3.

3. The banks of those Streams which have an ebb and flow tide, have always appeared to me more firm and durable, and their beds less changeable, than those which have a regular current running in one direction.

*(Signed)* H. D.

4. I conceive that the Lands on each side of the Canal, would very soon be brought into a high state of cultivation (provided it is capable of it) as there would be a constant demand for Grain of every description in common use, as also for Native vegetables.

*(Signed)* H. D.

13. It would, in my opinion, be of the greatest advantage to the Commerce of Calcutta, as large boats are now detained for weeks before they can pass along [(1)] Tolly's Nullah, in consequence of its narrowness, and being so crowded with boats; and the destruction of property annually in this Nullah must be immense. from the boats being crushed together in the ebb tides; boats of a larger size are obliged to leave the common tract at, (or near) the Altarah Banka, and go round by Diamond Harbour, which route can only be had recourse to during three or four months of the year.

(1) Paper E. para. 23

*(Signed)* H. DAVIDSON.

# E 50.

To H. MACKENZIE, ESQ

*Secretary to Government, Territorial &c. &c. Dept. Fort William.*

SIR,

Under instructions from the Special Committee on Lieutenant Schalch's Canals, I have the honor to request, that you will favor me with a copy of all correspondence (carried on through the Surveyor General) on Lieutenant William Morrieson's projected Cut, in the Sunderbunds, together with the Estimate furnished by that Officer, and Statement of the ultimate Cost of completing the undertaking.

The proposition was dated in March 1812, and transmitted to Major General Garstin, Surveyor General, on the 19th of the following month. Lieutenant Morrieson was appointed by Government to conduct the undertaking on the 18th of May. An advance of 3.000 Rupees was applied for,—and on the 9th March, 1813, the work was completed and the Canal opened; on the latter occasion a particular Report on the success of the undertaking was made for the information of Government.

The Committee is anxious to close its report as expeditiously as possible, I shall therefore be obliged by your forwarding to me the Documents now solicited, at your earliest convenience

I have, &c.

CALCUTTA,
*8th July*, 1822.

*(Signed)* R. C. FAITHFULL,
*Secretary Special Committee Lieutenant Schalch's, Plans.*

# E 51.

**No. 164.**

To CHARLES LUSHINGTON, ESQ.

*Secretary to Government, General and Foreign Depts. &c. &c.*
*Fort William.*

SIR,

Under instructions from the Special Committee on Lieutenant Schalch's Canals, I have the honor to request, that you will favor me with copies of the under-mentioned correspondence, which appears likely to elucidate certain points now under consideration by the Committee.

1. The Reply to a Letter addressed by the Surveyor General to G H. Barlow, Esq. Chief Secretary to Government, date 12th May 1801, relative to a projected experiment intended to keep the Jellinghy River in a navigable state during the Dry Season.

2. A copy of a Letter addressed by J. Lumsden, Esq. Chief Secretary to Government, to the Surveyor General, dated the 13th July 1802, calling for an estimate of the probable expense of an experiment for keeping open the Jellinghy River.

3. The Reply to the Letter and Estimate above alluded to, (furnished by the Surveyor General) addressed to J. Lumsden, Esq., Chief Secretary to Government, dated 17th August 1802, and which it is presumed, conveyed a relinquishment by Government of the Project, as I have been unable to trace any mention of it at a subsequent period.

The Committee being anxious to close its Report as expeditiously as possible, I shall therefore feel obliged by your forwarding to me the Documents above mentioned at your earliest convenience, should they appear on the records of your Department.

I have, &c.

CALCUTTA,
*8th July*, 1822.

*(Signed)* R. C. FAITHFULL,
*Secretary Special Committee on Lieut. Schalch's Plans.*

# E 52.

To CAPTAIN R. C. FAITHFULL,

*Secretary to the Special Committee on Lieutenant Schalch's Plans.*

General Department.

SIR,

I am directed by His Excellency the Most Noble the Governor General in Council, to acknowledge the receipt of your letter dated the 8th instant, and in compliance with your request, to transmit to you the accompanying copies of the several Documents mentioned in it, relative to the Jellinghy River.

I am, &c.

COUNCIL CHAMBER,
*The 18th July*, 1822.

*(Signed)* C. LUSHINGTON,
*Actg. Chief Secretary to the Government.*

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## E 52. a.

To G. H. BARLOW, ESQ.

*Chief Secretary to the Government.*

SIR.

Having frequently reflected on the possibility of improving the Inland Navigation of Bengal, by keeping open during the Dry Season the Cossimbazar, or Jellinghy, River, I now beg leave to submit, for the consideration of His Excellency the Most Noble the Governor General in Council, a proposal for a trial of the method which appears to me best calculated for the attainment of this desirable object.

As the principal cause of obstruction to the free Navigation of these Rivers is referable to the great bodies of sand, which are annually thrown into their beds by the Ganges, and which continue to choke, in different parts, but particularly at the places where they emerge from the great River, until the Rainy Season commences; it is obvious that no permanent excavation could be made to counteract this effect. But so long as the water of the Ganges continues, in the Dry Season, to be drained through either of these Rivers, in a stream ever so scanty, there is a chance of improving the means which nature continues to afford, and it might be hoped, of establishing ultimately, by an annual process, the free communication by water between Bengal and the Upper Provinces, at all Seasons of the year.

The difficulty of effecting this may not appear very great, if it be considered that in most of the Reaches of the Cossimbazar, and Jellinghy Rivers, there is water sufficient at all times for Boats of any size, and that the parts which become unnavigable in the Dry Season, bear no proportion to those which are navigable. It is evident therefore that the removal, or partial excavation of the Shallows, could afford the only means of rendering these Rivers navigable at all times: and as the draft of water for Boats of a moderate burden would not exceed two feet and a half, it might possibly be done at an expense comparatively small.

The idea I have long had upon this subject is, that if an iron rake of sufficient dimensions, or any other instrument of that nature, were to be employed to stir up the sand upon such of the Shallows as are of inconsiderable length, the current would carry down the floating particles into those parts of the Stream, whose depth would admit of their subsiding without detriment. A machine somewhat similar to this I have lately seen described in a French Treatise on Rivers, where it is said to have been used with considerable success, in Holland, and in other parts of Europe.

The [Machiners] Machines I would use, two Models of which I have the honor to transmit, should be about the size of a gun carriage, with very broad wheels or trucks, the latter of which might be armed with spikes. A large rake with iron claws might be suspended over the axletree, with a long lever in front by which it could at any time be extricated from the sand. A back lever of sufficient power, could be applied to the rake No. 1. occasionally to force the claws into the sand. These Machines, would require several yoke of oxen to drag them, instead of Horses, which are used in Europe, and experience might suggest many improvements by which they would be rendered more effectual.

This process alone would not, I conceive, be sufficient to open the principal shoals at the head of the Cossimbazar and Jellinghy Rivers, these being frequently of such considerable length, that the sand would probably settle again, before it could reach the deeper parts of the Stream. For this part of the operation I would propose, that an adequate number of Bildars and Coolies be employed, to excavate a part of the channel to the depth of two feet, and of sufficient breadth for two of the largest Boats to pass abreast, after which there might be reason to hope, that, with the help of the Dragging Machines, the Current of the River would deepen it still more. It might be necessary, in order to prevent the too great expansion of the stream, to enclose it between two Mounds or Dykes, which could be thrown up from the sand to be excavated—thus forming a temporary Canal within the natural bed of the River, as represented in the Plan and Section which I have the honor to transmit.

The most likely impediment to an attempt of this sort, would be quicksands occurring in the places to be excavated; but it remains yet to be proved, how far such do actually exist in the parts to be deepened, and whether it might not be possible to overcome even that difficulty.

As the Jellinghy River is by much the shortest in its course, it would seem to offer fewer difficulties in the way of this undertaking. Its present communication with the Ganges is through the Calculia, the head of which River is situated a little below Bogwangolah, and only 20 miles from the City of Moorshedabad, from which place and from Berhampore, labourers and utensils could easily be procured.

The whole process of the experiment would probably last but a few days, and I should hope that, if it were successful, there would be no occasion for a repetition of it during the remainder of the Dry Season, as any new gatherings of sand need not be apprehended at that time of the year. It might be necessary to retain a few of the people only till such time as the River had subsided to its lowest level in February, or March, when the Dragging Machines and other implements could be laid up in a shed near the principal spot to serve again—by which the expense of the following year would be considerably lessened.

I could not pretend to form an estimate of the total expense of the Scheme previous to Surveying the Jellinghy and Calculia, taking the necessary Levels, and Sounding these Rivers throughout—but should Government be pleased to depute me on the Survey, and to authorize me to prepare, before the ensuing month of November, as many of the Dragging Machines as might be necessary for a complete trial of their effect, I could proceed at the time stated with the implements requisite for the undertaking, when a few weeks might suffice for determining whether the object in view is attainable by the means which I have the honor to propose.

I have, &c.

SURVEYOR GENERAL'S OFFICE, 12*th May*, 1801.

(*Signed*) R. H. COLEBROOKE, *Major*. *Surveyor General.*

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## E 52. *b.*

To MAJOR R. H. COLEBROOKE,

*Surveyor General.*

SIR,

I am directed by His Excellency the Most Noble the Governor General in Council, to acknowledge the receipt of your letter of the 12th May 1801, proposing a Plan for improving the Inland Navigation of Bengal, by keeping open, during the Dry Season, the Cossimbazar or Jellinghy River.

2. His Excellency in Council directs me to desire that you will furnish an Estimate of the probable expense of an experiment to ascertain the practicability of the Plan for opening the Jellinghy by the means proposed by you, confining the experiment however to one dragging Machine.

3. His Excellency in Council further desires that you will proceed at the proper season of the year, to Survey the Jellinghy, and to carry the experiment into effect after the Estimate of Expense shall have been approved by Government.

4. You will transmit to me, for the information of His Excellency, a full Report of your Survey, and of the result of the experiment, together with such information on the subject, as shall enable the Governor General in Council to decide on the utility of the plan, and to ascertain the probable expense of carrying it into effect, should that measure appear to His Excellency in Council to be advisable.

I have, &c.

COUNCIL CHAMBER,
*The 13th July*, 1802.

(*Signed*) JOHN LUMSDEN,
*Chief Secretary to the Government.*

## E 52. *c.*

To JOHN LUMSDEN, ESQ.

*Chief Secretary to the Government.*

SIR,

I have lately been honored with your letter of the 13th ultimo, requiring me to furnish an Estimate of the probable expense of an experiment to keep open the Jellinghy, and to proceed at the proper season, to Survey that River, as well as to carry the Experiment into effect.

Having duly reconsidered the proposal which I had the honor to submit last year to His Excellency, the Most Noble the Governor General in Council, I have now reason to think, that the use of about thirty flat bottom Boats will be indispensably necessary; and that in case the difficulties of opening that River should not, upon the Survey, appear insurmountable, the assistance of about five hundred coolies, to be employed in deepening the bed of that River, in the places where it is usually obstructed by Shallows, but particularly at the place where it comes out of the Ganges, should be allowed me for that purpose.

With these additional helps it might be possible, I should hope, to keep open the Jellinghy River during the ensuing dry Season: but in case it should be found practicable to do so, a renewal of the process should be made to effect it, on every succeeding year, as in consequence of the periodical inundations, fresh accumulations of sand must be expected.

I have confined the present Estimate to one Dragging Machine: but it is probable that a greater number would be required on future occasions, or that one might be necessary for each shallow.

I beg leave to acquaint you that the proper season for setting out upon the Survey, will be about the beginning of October next.

I have, &c.

SURVEYOR GENERAL'S OFFICE,
*The 17th August*, 1802.

*(Signed)* R. H. COLEBROOKE,
*Surveyor General.*

## E 52. c.

### *Estimate of the probable Expense of an experiment to keep open the Jellinghy River in the Dry Season of* 1802-3.

| | Sa. Rs. |
|---|---|
| For one Dragging Machine, to be made after the Model, with its carriage yokes and tackle complete. | 450 |
| For thirty strong Bullocks to put the Dragging Machine in motion, at 20 each. | 600 |
| For 15 Bullock Drivers to be paid for 4 months, during which the Machine may be tried in different parts of the River at 4 each. | 240 |
| For feeding the Bullocks, during ditto, at 4 each. | 480 |
| For one small accommodation Boat to go into shallow water, to enable me or an Assistant to follow the track of the Dragging Machine, and superintend the Workmen. | 200 |
| For 30 flat bottom boats to be employed upon the Shallows in excavating the sand, at 40 each. | 1,200 |
| For 60 Dandies in 4 months for ditto, ditto. | 960 |
| For 20 Bildars to be employed during the whole time of the Survey and Experiments at 5 each. | 400 |
| For 1 Tindal and 10 Lascars during ditto, ditto. | 280 |
| Boat hire for transporting the Dragging Machine, tents, entrenching tools, to the head of the Calculia River, and for the accommodation of a small escort of Lascars, Bildars, &c. @ 300 per month. | 1,200 |
| For 500 Coolies to be employed during one month in clearing the head of the Calculia and other Shallows of the Jellinghy River. | 2,000 |
| For 500 iron shovels, at 2 Rs. each. | 1,000 |
| For a Writer and 1 Sircar during 4 months. | 200 |
| For Contingencies, including levelling staves, kodalies, sounding lines, bamboos, ropes, and repairs, &c. &c. | 790 |
| Total, *Ten thousand* Sa. Rs. | 10,000 |

*(Signed)* R. H. COLEBROOKE,
*Surveyor General.*

True Copies.

*(Signed)* C. LUSHINGTON,
*Actg. Chief Secretary to the Government.*

SURVEYOR GENERAL'S OFFICE,
*The 17th August*, 1802.

# E 53.

To CAPTAIN R. C. FAITHFULL,

*Secretary to the Committee on Lieutenant Schalch's Plans.*

Territorial Department, Revenue

SIR,

1. Extract from the Proceedings in the Public Department, dated 3d April, 1822.
2. Orders to Board of Revenue, dated 11th Ditto.
3. Extract from the Proceedings in the Military Department, dated 11th April, 1812.
4. Orders to Board of Revenue dated 18th Ditto.
5. Letter from Surveyor General, dated 20th May, 1812, with enclosures from Lieut. Morrieson.
6. Ditto, ditto, 10th February, 1813, with ditto.
7. Ditto, from Acting Chief Engineer, dated 18th March, 1813, with enclosure from Lieutenant Morrieson.
8. Ditto, Military Auditor General, dated 20th March, 1813.
9. Ditto, from ditto, dated 10th April, 1813, with enclosure.
10. Ditto, to Acting Chief Engineer, dated 10th April, 1813.

I am directed by the Governor General in Council, to acknowledge the receipt of your letter dated the 8th instant, and to transmit to you, for the information of the Committee, Copies of the several Papers specified in the margin, relative to the Cut made by Lieut. William Morrieson, in the Sunderbunds.

I am &c.

*(Signed)* HOLT MACKENZIE,
*Secty. to the Government*

COUNCIL CHAMBER,
*The 18th July,* 1822.

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# E 53. *a.*

(Copies.)

## 1. *Extract from the Proceedings of the Right Honorable the Governor General in Council, in the separate Department, under date the 3d April,* 1812.

To THE RIGHT HONORABLE GILBERT, LORD MINTO,

*Governor General in Council.*

MY LORD,

We have the honor to lay before your Lordship in Council, the enclosed copy of a letter from the Salt Agent of the 24 Purgunnahs, dated the 15th instant, together with a sketch of the Map, which accompanied it.

2. We are unacquainted with the probable expense which would attend the execution of the work mentioned by the Agent, but if it is not considerable, we are of opinion, that by making the proposed Cut between the Collindee and Roymungul Rivers, great advantages are likely to arise to the manufacture of Salt in his Agency, and therefore beg leave to recommend its being carried into effect.

We have &c.

*(Signed)* G. UDNY.

CALCUTTA SALT OFFICE,
*The 26th March,* 1812.

# E 53. a.[1]

To JOHN LUMSDEN, ESQ.

*President and Members of the Board of Trade, Fort William.*

GENTLEMEN,

Lieutenant E. Morrieson, who is now on a Survey in the Sunderbunds, has obligingly communicated to me a Recommendation he has transmitted to the Surveyor General for opening a new Cut, which he conceives would be highly beneficial, not only to the General Trade of the Country, but also to the Public Revenue, by the great advantages it would afford to the salt manufacture in this Agency. These advantages appear to me so self-evident, that I think it my duty to communicate the circumstance to you, in the hope, that should you see it in the same point of view, you will add your recommendation to Government, that it may be carried into effect.

I beg to subjoin an Extract of a Letter to me on the subject from Mr. Bainbridge, my Superintendent in that quarter, and also a rough sketch of the alteration proposed.

"[1]The Cut from the Keellender River to the Burra Cooleah, would be of incalculable advantage to your Agency. I am fully satisfied that it would give us between two and three hundred Callaries of the very best kind. I send his proposal and Plan for your inspection, *which he requested I would do.* If you should think well of it, I would point out in detail to you, the advantages the Agency would derive from it, by an increase of Callaries, and the security with which the Tuffaul Salt might be brought, in consequence of it, to Mooktarpore; it would also shorten the passage between this and Pertaubnaghur, from six to twelve hours, besides avoiding that dangerous part of it, the Chootah Cooliah, with which you are well acquainted ; you will find a place marked in the Map *Bankra*, on the South-east bank of the Chootah Cooliah, where I established this year twenty-four Callaries under Balleah, and they are turning out uncommonly well, and if we could succeed in getting this Cut made, it would throw all the lands, both on the *South-east* and *North-west* banks of the Cooliah, into your hands for Callaries; by throwing a bund across the entrance of the Choota Cooleah, we might, in the springs, lay both banks of it under salt-water, and it is *so salt there*, that our earth would not be in the least inferior to, or less productive, than the Tuffaul earth. I don't like to say what the advantages of it would be; I am sure, if I stated the conviction on my mind of its advantages to the Agency, I should be thought little better than a visionary."

(1) Paper E. para 12.

I have &c.

(*Signed*) JOHN D'OYLY,
*Agent.*

24-PURGUNNAHS,
SALT AGENT'S OFFICE.
*The 15th March*, 1822.

A True Copy.

(*Signed*) T. PLOWDEN,
*Acting Secretary.*

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## E 53. *a.*[2]

RESOLUTION.—Ordered, that a Copy of the foregoing Letter from the Board of Trade, and of its enclosure from the Salt Agent of the 24-Purgunnahs, together with the Plan which accompanied it, be transmitted to the Revenue Department, that a reference may be made to the Collector of that District, to ascertain if there is any objection to making the Cut recommended by the Board, for the purpose of making a communication between the Collindee and Roymungul Rivers.

(A true Extract.)

*(Signed)* C. M. RICKETTS.
*Secretary to the Government.*

## E 53. *b.*

*Extract of a Letter to the Board of Revenue, under date the 11th April,* 1812.

Para. 7. I am directed likewise to transmit to you the enclosed Extract from the Proceedings of Government in the Public Department, together with the Sketch mentioned to accompany it, for the Report required respecting the Channel proposed to be opened between the Roymungul and Collindee Rivers.

## E 53. *c.*

No. 194.

*Extract from the Proceedings of the Right Honorable the Governor General in Council, in the Military Department, under date the 11th April,* 1812.

To C. W. GARDINER, ESQ.
*Acting Secretary to Government, Military Department.*

SIR,

At the request of Lieutenant Morrieson of the Engineer corps, I herewith transmit a letter addressed to me, together with a copy of a Survey shewing the advantage of a Cut proposed to join the Kallindee and Burrah Kooleah Rivers.

If it is dug to the depth of two Chobahs, [Chowkahs] or eighteen feet, and made fifty feet wide, the contents to be excavated will be as follows,[1]

(1) Paper E. para. 12.

| Length. Feet. | | Deep, | | Wide. | | | | S. F's. choba. | | chobas. |
|---|---|---|---|---|---|---|---|---|---|---|
| 2,640 | × | 18 | × | 50 | = | 23,76,000 | ÷ | 729 | = | 3,259. |

This work may be done at 1 Rs. 4 Ans. per Chobah, [Chowkahs] and will cost, Sa. Rs. 4,073 : 12 : 0, say 5,000 Rupees to cover every expense—a moderate sum when the advantages are considered.

I have, &c.

*(Signed)* J. GARSTIN,
*Surveyor General.*

SURVEYOR GENERAL'S OFFICE,
*9th of April,* 1812.

## E 53. c.[d]

MAJOR GENERAL GARSTIN,

*Surveyor General, &c. &c.*

SIR,

I have the honor to send accompanying a Survey of the Chota and Burreah Kooleahs, with part of the Kalindee River, shewing a Cut that I propose should be made for the benefit of Trade—and may eventually prove a considerable increase of Revenue.

Considering the extensive Trade that is carried on through the two Kooliahs, being the principal passage of communication from all the Eastern Districts to Calcutta, it is worthy the attention of Government to consider how that passage may be rendered safer, shorter, and of course more expeditious; particularly when this may be accomplished with little or no expense.

The proposed Cut is not half a mile, and if opened would save two tides, or 12 hours, at the same time do away with the Chota Kooliah entirely, which is the most dangerous and difficult part of the whole Navigation.

The immediate advantage to Government will be, that the whole of the Salt manufactured in the Roymungul being lodged in the Golahs at Muckterpore, will run much less risk in the passage; and that this is not unworthy the consideration of Government, is proved by the loss that was lately, and has frequently, been sustained, in this C. Kooliah.

The second advantage accruing to Government, is the suggestion of the Assistant to the Salt Agent, that the C. Kooliah may then be shut—by which means the manufacture of Salt in the immediate vicinity of the Golahs will be much improved, by excluding the water from the Jaboona, which is fresh.

A trifling toll might even be collected for a limited time, to defray any expense that may attend the cutting of it. This however I do not mean to be understood as recommending, convinced as I am that Government will be amply repaid for any expense incurred by the advantages set forth.

In the event of Government carrying this proposition into effect, my Survey being at no great distance, I can easily afford any assistance that may be required in superintending the work.

I have &c.

SUNDERBUNS,
*12th March*, 1812.

*(Signed)* W. E MORRIESON,
*Lieutenant Engineers, Surveying the Sunderbuns.*

## E 53. c.(2)

The Governor General in Council is pleased to authorize the immediate commencement and execution of the Cut proposed to join the Kalindee and Burrah Kooliah Rivers in the Sunderbuns, under the Superintendence of Lieutenant Morrieson, of the Engineer Corps.

ORDERED,---That the Surveyor General be desired to furnish Lieutenant Morrieson with such instructions for his guidance as he may consider necessary.

ORDERED,—That an extract from the Proceedings be recorded in the Revenue Department, with a view to the adjustment with the Proprietors, should such a measure be found necessary for the Land through which the Cut is to be made.

A True Copy,

(*Signed*) C. W. GARDINER,

*Acting Secretary to Government.*

## E 53. d.

*Extract from a Letter to the Board of Revenue, dated the 18th April, 1812.*

Para. 9. In continuation of the reference of the 11th instant, I am directed to transmit to you, for your guidance, the enclosed further Extract from the Proceedings of Government in the Military Department, respecting the Cut proposed to be made for the purpose of uniting the Kalindee and Burrah Kooliah Rivers.

## E 53. e.

To JOHN ADAM, ESQ.

*Secretary to Government, Military Department*

SIR,

I have the honor to transmit the accompanying Copy of a Letter from Lieutenant W. E. Morrieson of Engineers, and request permission to recommend that an order be issued in his favour on the General Treasury, for the sum of Sicca Rupees Three Thousand, to enable him to proceed in the construction of the Canal, which has been authorized by Government.

I have &c.

(*Signed*) JOHN GARSTIN, *Major General, Surveyor General.*

FORT WILLIAM,
SURVEYOR GENERAL'S OFFICE,
*The 20th May*, 1812.

## E 53. *e.*[1]

To MAJOR GENERAL GARSTIN,

*Surveyor General, &c. &c.*

SIR,

Government having been pleased to authorize the immediate commencement of the Canal recommended by me to be made in the Sunderbunds, I beg leave to state that an advance of money for that purpose is necessary; and request that you will be so good as to forward this application through the proper channel, in order that an Order on the Treasury may be obtained for Three Thousand Rupees (Sa. Rs. 3,000), or what other sum you may think most advisable in the present instance.

Memo: advance of 3,000 Rs. ordered 23d. May, 1812

I have &c.

CALCUTTA,
*18th May* 1812.

(*Signed*) W. E. MORRIESON,
*Lieutenant Engineers.*

(A true copy)
(*Signed*) JOHN GARSTIN.

## E 53. *f.*

To C. W. GARDINER, ESQ.,

*Secretary to Government, Military Department.*

Sir,

I have the honor to enclose a Letter from Lieutenant W. E. Morrieson of the Engineers, now employed in making the Canal between the Burrah and Chotta Kooliah Rivers, in the Sunderbunds, reporting progress, and requesting an early supply of cash, to enable him to complete the work.

I am, &c.

(*Signed*) JOHN GARSTIN
*Surveyor General.*

FORT WILLIAM,
SURVEYOR GENERAL'S OFFICE,
*16th of February*, 1813.

## E 53. *f.*[1]

To MAJOR GENERAL GARSTIN &c. &c. &c.

*Fort William*

SIR,

I have the honor to inform you that the Canal for the communication of the Kallindah and Burrah Kooleah Rivers, the execution of which Government has been pleased to entrust to me, is in a state of great forwardness, notwithstanding the many difficulties I have had to encounter in procuring people to work in the jungles; so much so, indeed, that I am in hopes of having the whole completed in the course of the next month, and you will oblige me by procuring a further advance of cash.

The advantages of this Canal are too apparent to require any comment, and are I believe fully appreciated by the Government with a view towards the improvement of the navigation; but it will no doubt become an object of the Salt Agent, as soon as the passage is opened, to have that by the Chotah Kooleah shut up; as by that means the Salt Manufactory at Bankra might be increased to almost any extent, and certainly at the lowest estimate, an additional Revenue of one lac of Rupees may be obtained in consequence. This however will come under the notice of Sir John D'Oyly, who is so well able to appreciate the real interest of his Agency.

I have to request you will use as little delay as possible, in procuring me a further advance of money authorized for this work, every thing being now in a proper train for the completion of it, and it is of consequence to have it opened before the winds set in strong from the Southward.

Advance of Rs. 2,000, ordered 15th February, 1813

I am also anxious to get it off hand, to enable me to prosecute my Survey with fewer interruptions

I have, &c

SUNDERBUNS, *(Signed)* W. C. MORRIESON,
*12th February, 1813* *Lieutenant Engineers*

# E 53. *g.*

To CHARLES WRIGHTE GARDINER, ESQ

*Secretary to Government, Military Department*

SIR,

I have much gratification in forwarding the enclosed Letter from Lieutenant Morrieson of the Engineer Corps, and in being able to bear testimony to the great exertions this Officer made to accomplish the business he undertook. In all probability the Canal he has opened, will enlarge itself so as to become nearly of the same dimensions as the two Rivers to which it forms a junction; and from every account I hear, it promises to be infinitely useful.

I have, &c

CHIEF ENGINEER'S OFFICE, *(Signed)* JOHN GARSTIN, *Major General,*
FORT WILLIAM, *In charge of the Engineer Department*
*18th of March*, 1813

# E 53. *h.*

To MAJOR GENERAL GARSTIN,

*Chief Engineer, &c. Fort William.*

SIR,

On the 12th February, I had the honor to write to you on the subject of the forward state of my Canal, and at the same time requested you to procure for me a further supply of money. I have now much pleasure in reporting to you, for the information of Government, that the Canal is open, and promises to answer my most sanguine expectation

It is with great satisfaction I have to state, that any further supply of money will be unnecessary, as every expense will be covered by the Three Thousand Rupees I have already received. Every item of expenditure I cannot at present state, and it will require my presence in Calcutta to collect them; but there are Codahlies and Planks which may be valued at about 120 Rs. the property of Government, respecting which you will have the goodness to convey to me the orders of Government.

With respect to any remuneration Government may be pleased to make me for the extraordinary trouble I have been subjected to, and which I was far from foreseeing at the time I offered to undertake this work, I shall leave entirely to its liberality; contenting myself merely by observing, that were it to be measured by the advantages Government will derive from the work, it would far exceed my expectations.

I have, &c.

*(Signed)* W. E MORRIESON,
*Lieutenant Engineers*

# E 53. *i.*

No. 377.

To MAJOR H. IMLACH,
*Military Auditor General.*

Military Department

SIR,

I am directed by the Right Honorable the Governor General in Council, to acquaint you that it appears from a communication received from the Acting Chief Engineer, that the sum of Sa. Rs. 2,000, which was authorized by my Letter of the 20th ultimo, to be issued to Lieutenant Morrieson of Engineers, as a further and last advance on account of the Canal constructing by him in the Soonderbunds, is now not required by that Officer.

2. Lieutenant Morrieson, in reporting the completion of this work, has submitted for the consideration of Government an application for some remuneration being granted to him for the extraordinary trouble, which he has been subjected to in superintending the excavation of the Canal in question, and which he did not foresee when he offered to undertake the work; and you are desired by His Lordship in Council to suggest the scale of remuneration which you would recommend to be made to that Officer for his services on this occasion, with reference to the circumstance of his having been in the receipt of Surveyor's allowances during the period he was engaged in cutting the Canal.

I am, &c.

COUNCIL CHAMBER,
*20th March*, 1813.

*(Signed)* C. W. GARDINER,
*Secretary to Government.*

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# E 53. j.

No. 326.

To THE RIGHT HONORABLE LORD MINTO,

*Governor General in Council.*

Military Department.

MY LORD,

I have the honor to acknowledge the receipt of Mr. Secretary Gardiner's Letter, under date the 20th ultimo, on the subject of an application on the part of Lieutenant Morrieson of the Engineers for a remuneration for the extraordinary trouble which he has [been] subjected to, in superintending the excavation of a Canal in the Sunderbunds directing me to suggest the scale of remuneration to be made to him for his services on the occasion, with reference to the circumstance of his having received Surveyor's allowances during the period he was engaged in cutting the Canal.

2. On the prescribed information having been communicated to this Office by the Surveyor General, as contained in his Letter bearing date the 12th March last, copy of which I have the honor to submit to your Lordship in Council, that satisfactory Field Books had been received by him from Lieutenant Morrieson, to the end of February last, allowances as River Surveyor, or Sonat Rupees 858, have been passed to Lieutenant Morrieson.

3. That Lieutenant Morrieson could so have managed his time as to furnish the Surveyor General with satisfactory Field Books of his Survey of the Sunderbunds, and likewise have superintended the excavation of a Canal, in doing which he was subjected to extraordinary trouble, I feel some difficulty in comprehending; but I feel no hesitation in expressing my opinion, that if an Officer employed on a Survey conscientiously performs his duty, he cannot at the same time effectually superintend the cutting of a Canal, or the execution of a work upon trust; and being of opinion, that an Officer cannot at the same time perform both the specified duties, I cannot consider him entitled to remuneration for both.

I have, &c.

MILITARY AUDR. GENL'S. OFFICE,
*6th April*, 1813.

*(Signed)* H. IMLACH,
*M. A. General.*

# E 53. j.(1)

To MAJOR H. IMLACH,

*Military Auditor General.*

SIR,

I have received the Field Books from Lieutenant W. E. Morrieson, Engineer, for the months of December 1812, and January, February, 1813; which are satisfactory.

I am, &c.

FORT WILLIAM,
SURV. GENL'S OFFICE,
*The 12th March*, 1813.

*(Signed)* JOHN GARSTIN,
*Surveyor General.*

# E 53. k.

No. 205.

To MAJOR GENERAL GARSTIN,

*In Charge of the Engineer Corps.*

SIR,

I am directed by the Right Honorable the Governor General in Council to acknowledge the receipt of your Letter of the 18th ultimo, with its enclosure, and in reply, to inform you, that, as Lieutenant Morrieson has been in the receipt of allowances of a Surveyor of Rivers during the period he has been employed in constructing the Canal in the Sunderbuns, His Lordship in Council does not consider him entitled to any further remuneration.

2. In making the communication, I am directed to desire that you will instruct Lieutenant Morrieson to deliver into store the Codalies and Planks, the property of Government, mentioned in the second paragraph of his Letter to your address, above acknowledged.

I am, &c.

COUNCIL CHAMBER, *The 10th April.* (*Signed*) C. W. GARDINER, *Secretary to Government.*

(True Copies.)

TERRITORIAL DEPARTMENT. *The 18th July*, 1822. (*Signed*) HOLT MACKENZIE, *Secretary to Government.*

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# E 54.

Paper E para 14.

## [*Paper drawn up by Major Rennell since his return to Europe.*]

(Copy.)

The advantages of a nearer Cut to and from Calcutta and the Upper Provinces, than that by the *Salt Lake* and the *Sunderbunds*, has always been self-evident; more especially as the direct passage continues to be shut up during so large a portion of the whole year.

But this evil arises from natural causes, and which appear to be not easily remediable. In order to make myself understood, it will be necessary to go a little into the nature of the courses and changes of those Rivers.

The general history of the alluvions of Rivers applies to those of every class, but we collect our ideas mostly from the capital ones—which not only afford a greater scope of matter for observation, but, are quicker in their most powerful operations and changes. Their history is briefly this:—Having by degrees formed a gradually inclined plain by the matter which they bring down; and having advanced this plain *far within* the ancient limits of the Sea, they gradually lose that degree of declivity in their beds, that is necessary to carry them onward; at the same time that, by the gradual elevation of the

whole surface of the country, as well as their own beds, by the depositions laid on both by the periodical floods, an *additional obstacle* is thrown in the way of their progress.

(1) Paper E para 36.

[1]These ideas we conceive to be fully justified by the actual state of things in the *Ganges*. In remote times, this River doubtless gained the Sea by the Western Channel, (or Hoogly River,) but having raised *that* too high, it sought a *lower* bed in a new situation, and by a repetition of the same causes and effects, moved progressively to that bed in which we now find it; after having in turn occupied the several intermediate channels, whose *upper parts* are now nearly filled up, whilst the lower parts have been kept open by means of the flux and reflux of the Tides. We find that the further we go *Eastward*, the deeper are the intermediate channels; in other words, they have been the latest forsaken by the Great River, such is the Chundnah Creek, and its termination the Hooringotta River.

Thus the operations of Nature are continually directed towards filling up the deserted beds of the Great River, and in raising the *general level* between them; in effect repairing and finishing her works.

(2) Paper E para. 38.

To [2]apply this history to the purpose before me, I shall beg leave to state that the deficiencies of water for Navigation in the Western quarter of the *Delta*, are incurable, otherwise than by the measure of cutting such a length of Canal, and, that, on such an *enlarged Section* as will ensure at all times a sufficient volume of water, not only for the *immediate* purpose of Navigation, but to keep the channel constantly open by the removal of matter that has a tendency to collect in it. But such a work must necessarily be attended with a *vast* expense, probably greater than the value of the advantages in prospect: at the same time any other *measure* must be regarded as merely a *temporary* one, whose expense, as well as the advantages resulting, or expected to result, *must also be calculated*. I venture to pronounce such a work *temporary*, from the experience of many years observation on the nature and properties of the Bengal and other Rivers.

I have hitherto only spoken of the gradual changes effected by causes that are *regular* and *constant*. It remains to speak of the causes of more *sudden* and *violent* changes, which exist in the periodical floods of tropical Rivers. Within the space which contains the subject in question, *these* swell the Rivers from 15 to 30 feet or more perpendicular; increasing in height gradually as we leave the neighbourhood of the sea. It has happened that a branch as big as the *Trent*, has from a perfectly navigable state before the Floods, been rendered unnavigable in the course of one Season; and, on the contrary, a new Navigation has been opened by the same cause. The chances however are much *against* a *favorable* change, in the tract alluded to; although some such change must have happened to enable *Lieutenant Bowie* to pass from the Ganges into the *Issamoty* River in the beginning of the month of March. But as the waters would *continue* to *fall* until the *latter* end of April, that interval would produce a great change in the depths, in a part where the whole fall is between 15 and 30 feet.

As no Report on the depth of the upper part of the Issamoty and other Waters that communicate immediately with the Ganges has yet come to hand, the materials before me must be considered as incomplete, as far as they respect the specific question of the intended passage; I have therefore been confined rather to the question of the *general tendency* of such kind of works.

* Sic in Original.—J. M.

I am clearly of opinion, that unless the opening the * from the Ganges, and the continuation of the waters downwards to Sibnibas and the place proposed to be cut

through, should be found of a sufficient depth, at the driest season, that no expense whatever ought to be incurred; for admitting a bare sufficiency of water *now*, the chances are *against* its continuing open long.

With respect to the proposed measure of letting the Water of one River into another, great caution ought to be observed—where the produce of the soil depends so much on the preservation of water courses. It may be feared that the difference of Levels, *pointed* out in so short a distance as that between the *Sibnibas* River and the *Hurdum*, may occasion the letting out of all the Water of the upper River, and do great mischief to the Countries below in the Tracks of both Rivers—in the one by the loss of Water; in the other, by a double portion of water poured into one bed. It may be observed that nature seems to have adjusted matters very nicely, in respect to the capacity of River beds, and their levels; so that any tampering with them in delicate cases (particularly where there is so great a periodical swelling and velocity of current) may be productive of much mischief.

The Bed of the *Hurdum* River cannot contain its own waters together with those of Issamuty—itself a larger Body of water: we could quote several examples of damage done by altering the natural courses of Rivers—by turning them into the beds of others possibly; the Floods in the *Level* last winter, originated in this cause.

It may possibly be said, that the successful experiment of Colonel Tolley's is in favor of attempting such works. There is however a wide difference in the circumstances of the two cases. It is to be observed, that it is the nature of Floods in Rivers to diminish gradually in their height as they approach the Sea, because the Sea preserves its levels at all times (under equal circumstances) of tide, and necessarily influences that of the waters that communicate with it. Now Colonel Tolley's Canal is situated so low down, that the periodical Flood has nearly lost its effect, but at *Sibnibas* the difference may be from 15 to 20 feet at different Seasons, and in the Ganges, *certainly* 30 or more.

(*Signed*) T. RENNELL.

SUFFOLK STREET,
CAVENDISH SQUARE.
*March* 18*th*, 1796.

A True Copy. (*Signed*) D. SETON, JR.
*Acting. Sub. Secretary*

A True Copy.

*Examined, Nichls. Nugeret.*

(*Signed*) R. C. FAITHFULL,
*Secretary.*

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# E 55.

(Copy.)

To THE HONORABLE, SIR JOHN SHORE, BART

*Governor General in Council.*

SIR,

Agreeably to the Orders of the Honorable Board, conveyed in a letter dated 23d January, by Mr. Sub-Secretary Shakespeare, I proceeded on the 1st of the ensuing month to examine the Hurdum, to ascertain the practicability of establishing a communication by water between the Rivers Hoogley and Ganges at all times of the year.

Having understood the Jabouna Creek had been mentioned as the most likely to afford such a passage, I took a cursory look at it on my way; but after walking along

its banks, I had no reason to be satisfied with its appearance. It is a small Rivulet, winding and intricate in its course, and the stream so narrow, that it may be skipped over in some places at low water. It would appear by the Maps that this Nullah, including its windings, is from thirty to forty miles in length, and although in the Rainy Season it is said to afford a passage from the Issamuty to the Hoogly River, for boats of the largest burthen, yet it would be difficult and expensive to clear it, so as to render it navigable at all Seasons, not only on account of its length, narrow channel, and winding course, but also, because its banks are in some parts lined with Trees, Huts, and Plantations, which it would be necessary to remove.

I proceeded next to the Hurdum, or as it is called in the Maps, and by some of the Natives, the Choornee Creek, and have now the honor to lay before the Board a correct Survey of that River, from its source at Sibnibas to its confluence with the Hoogly. This River is also said to afford a passage from the Issamuty in the Rains. It is navigable, as will appear from the accompanying Map, (the soundings being marked in feet) to a little way beyond Honscolly.—Its breadth at this place is about thirty yards, and it increases rather gradually *toward** than half a furlong below. The depth of the water varies from five to sixteen feet, and more—being navigable during the whole year for any vessels constructed for Inland Navigation. Its Banks are sloping, and its course comparatively direct. It is free from sands, and shallows, the soil of its bed being chiefly clay, and it flows through a Country well cultivated, and abounding in Grain and Cattle. The Tides rise at the mouth of the Choornee about 4 feet during the springs, and one foot and a half nearly at Honscolly.

* Sic in Original.—M.

At the distance of a mile from Honscolly, and six miles and a quarter from the nearest part of the Issamuty, this beautiful River becomes so narrow and intricate as to be no further navigable for boats of any kind. Its banks appear broken, and the channel in some places so small, that it is even a matter of wonder, how Boats can get through this part of it in the Rains.

Following its course on foot, I surveyed it up to the Sibnibas Jeel, from which it issues, the length of the unnavigable track being five miles, and seven furlongs. There appeared in this part of it several springs, forming deep pools, in which the water was seen to bubble up. Many springs likewise are found in its banks, from which the water trickling down continually feeds the main branch. Of the latter kind I saw some as far down as Runnogaut.

From the Jeel to the Issamuty River there does not appear any channel of communication, except a dry water course, which probably fills in the Rains, so as to admit the passage of Boats into the Jeel, and from thence into the Choornee.

Having completed this part of my Survey, I proceeded next to observe, with the proper Instruments, the difference of Level between the two Rivers. Commencing from the place where the Hurdum ceases to be navigable, I carried my Levels in a line as direct as possible to the Issamuty, erecting the station staves at equal intervals of one furlong, or 220 yards each. The distance thus measured was six miles one furlong and a half, and the difference of the level was five feet and a half; the current of the Issamuty being so much higher than the water at Honscolly. This great difference of Level is further indicated by the rapid fall of the water from Sibnibas to Honscolly, and by the Tides rising a foot and a half at Honscolly, but never affecting, in the smallest degree, the Issamutty on this part of its course. I am inclined to think, too,

that the many springs in the Hurdum are another proof of this difference of Level, and that the water oozing from them originates from the Jellinghy and Issamutty Rivers, passing through the earth by small subterranean channels.

The Country from Honscolly to the banks of the Issamutty is an extensive plain, in some parts cultivated but chiefly covered with grass, which the people lay up in stock at Honscolly, and load their boats with, to carry down the stream to various places, where it is used in thatching houses, or feeding their cattle.

The soil is chiefly clay, the most favorable for a navigable Canal, but this would be an arduous and expensive undertaking if it were dig [digged] down at once to such a depth as the Canal must ultimately be, to afford a free passage at all times of the year. One method however suggests itself, and as it might be carried into execution, comparatively at a small expense, is worth trying. If a Cut of twenty feet wide by fifteen or twenty in depth, were made from the Issamutty to the Hurdum above Honscolly, it would open a free passage to the waters during the Rainy Season, and would prevent, in some measure, the overflowing of the Issamutty. The waters flowing through this Canal with great rapidity, during four or five months of the year would considerably widen, if not deepen the channel; and when, in the Dry Season, they should subside to their natural Level, so as to leave the Canal Dry, some further progress might then be made in deepening the channel, sloping the banks, &c. but it is probable the expense of digging after the first year would be inconsiderable.

Such a Cut would have its advantages, even if it should fail in the main object, as it would open a more direct communication with the Great River during the Wet Season, than by the Jellinghy or Cossimbazar Rivers: but it might be hoped, that it would establish in the end a perpetual thoroughfare for boats of all kinds; and that the inconveniences of the Sunderbund passage and Tolly's Nullah, would be entirely obviated. By an Estimate of the probable expense of making the first Cut, it would appear that it might be done for Thirty Thousand Rupees.

The Issamutty River, at the two places where I saw it, appears to have deep water, and to be clear of Shoals. Its banks are sloping, and in breadth half a furlong at least; there are several large boats upon it, some of which had recently come down from the Ganges. The people at Kissungunge informed me that this River is navigable during ten months of the year, but that during the months of April and May, there were three shallow places, over which the largest boats could not pass. At Dullingotta, about 2 miles below Kissengunge, they told me that the River was navigable at all Seasons for boats of 500 maunds; they gave no satisfactory answer to the inquiries I made as to the former state of the River, but if any change has taken place, it has probably been gradual, and to them imperceptible.

It remains now to ascertain by actual Survey, whether the Issamutty Rivers [are] really navigable at all seasons, or only during a part of the year; to perform which, as the Driest Season is now approaching, I propose going myself, or deputing Lieutenant Hoare, my Assistant, according as the Honorable Board may be pleased to direct.

I have the honor to be, with great respect,

Sir,

Your most obedient humble servant,

(*Signed*) R. H. COLEBROOKE,

*Surveyor General.*

CALCUTTA,

*12th March*, 1795.

P. S. The Plan No. 2. shews upon a larger scale the unnavigable part of the Choornee River, also the track of the Level, and the probable line of communication for a Canal to join the two Rivers. I have drawn it in a Serpentine course, on account of the great difference of Level, but should it be thought proper to make a small Cut only, as recommended above, so as to let the water run through with its utmost velocity, it would then be necessary to give it a more direct course, and the water might be let into the Choornee at Ryepoor, which is two miles higher than Honscolly.

A true Copy.

*(Signed)* R. C. FAITHFULL,
*Secretary.*

# E 56.

(Copy.)

To THE HONORABLE SIR JOHN SHORE, BART

*Governor General in Council, &c. &c. &c*

SIR,

Conformably to your orders communicated to me in a letter dated the 23d of March by Mr. Shakespeare, I proceeded in the month of April to finish the investigation concerning the proposed New Inland Navigation, by Surveying the Issamutty River, during the Driest Season of the year.

Setting out from hence, through Tolly's Nullah, and traversing a part of the Sunderbunds, I soon reached the Juboona River, which I found to be a continuation only of the Issamutty. This led me to the place where I had been in February, when after Surveying the Choornee River, I took Levels across the Country, with a view to ascertain the practicability of joining the two Streams by a navigable Canal.

The result of this Survey, with my Report thereon, I had the honor to lay before the Board soon after my return in March.

Continuing my Survey from this place, I examined carefully the depth of water in the Issamutty, &c. and as my Boat with those which accompanied me passed on with little or no trouble up to the inlet of the Howleah from the Ganges, I have now the satisfaction to acquaint you, that there is a free passage through the Issamutty, Coomer, and Howlea (which are only different names to denote the same River in different parts of its course) for Boats not exceeding seven hundred Maunds, at all times of the year.

This River is in general very winding in its course. Its banks are in some places sloping, and beautifully covered with verdure and trees. In others, where it takes a sharp turn, the Banks are steep and broken, and the water is found so deep that with a Line of near thirty feet, we sometime felt no bottom. But these great depths of the stream are of little avail, not being general; for in some of the reaches, where this River expands itself over a broad and sandy bed, or in other parts where the fishermen have erected bamboos and nets across the channel, which obstruct the current and cause a considerable accumulation of sand, the water becomes so shallow as to leave only a depth of two or three feet.

The shallows* however, are not many, and may always be cleared by boats of a moderate size. I am of opinion too, that the largest Woolacks, when deeply laden, may navigate this River during eight months of the year.

I examined particularly the opening of the Howliah to the Ganges, and had every reason to be satisfied with its appearance, there being a considerable depth of water; no sands which are likely to, in process of time, choak up the entrance.† There is indeed about a mile down from the Inlet, opposite to Dewangunge, a shelving sand, which projects across two-thirds of the bed of the River, leaving only a channel of about forty yards wide, and five feet‡ water, but should increase, is probable the stream will encroach in proportion on the opposite bank, so as to leave always a clear passage and a sufficient depth for any boats.

On my return to Kissengunge, I made some additional remarks on the state of this River, and examined more particularly the place where it is proposed to make the Cut. I am now clearly of opinion that the communication should be formed by digging a Canal from the Issamutty River a little above Kissengunge, to the Jeel at Sibnibas (the distance being one mile and a quarter); having found upon sounding the Jeel a considerable depth of water, except where a mud Bank extends across the Jeel, leaving only about one foot water. But this impediment might be removed, or it would probably open of itself, whensoever the stagnation of the waters should cease, and the current should begin to operate. This bank [is] narrow, and there is deep water on both sides of it. It remains then to deepen and render navigable that part of the Choornee, which issuing from the Jeel, runs down to Honscolly, (the distance being five miles) and this no doubt would be the most laborious part of the undertaking. But I am of opinion that the whole might be effected for a sum, which, as compared with the advantages that might arise from it, would appear trivial.

The particular benefits that would accrue to the country and to individuals, by establishing a direct and perpetual thoroughfare for boats from the Hooghly River to the Ganges, are obvious for me to add any comment. I have therefore only to hint that the Issamutty and Jabona Rivers, flowing most through a fertile and well cultivated country, it would open a ready passage for the inhabitants to bring their Grain and other Commodities to Market, and should it ever fail in the main design, it would in this particular, be productive of considerable benefit.

I have the honor to present accompanying the Letter, a correct Chart of the Issamutty, &c., from the Ganges down to the place where it is proposed to join it to the Choornee. The soundings are marked in feet, and as this part of the Survey was con-

* Note.—On this point, in the rough Draft Letter Book, Colonel Colebrooke, has made a pencil note, viz. "In 1794; but I found on my return through the River in 1796, that considerable quantities of sand had been thrown in from the Ganges."

(*Signed*) R. C. F.
*Secretary.*

† Note.—Here again Colonel C. has made an observation in the L. B. in pencil; viz. "In this prediction, I was wofully mistaken, as the event proved."

(*Signed*) R. C. F.
*Secretary.*

‡ Note.—Here again Colonel C. remarks; viz. "Here I found 40 feet water on my return."

(*Signed*) R. C. F.
*Secretary.*

cluded before the middle of May, there is every reason to believe it was performed while the River was at the lowest ebb.

I have yet to lay down and to present to the Honorable Board my track through the Sunderbunds, the Jaboona River, and that part of the Issamutty lying below the proposed junction, which will be done upon the same scale as the accompanying sheet; but as this has little or no relation to the object in view, and is only to be considered of importance so far as it is connected with the Geography of the country, I have hitherto deferred the projection of this part of my work.

I have the honor to be, with great respect,

Sir,

Your most obedient, humble servant,

CALCUTTA,
*15th September*, 1795.

*(Signed)* R. H. COLEBROOKE,
*Surveyor General.*

(A true Copy,) *(Signed)* R. C FAITHFULL.
*Secretary.*

# E 57.

(Copy.)

## TO THE HONORABLE SIR JOHN SHORE, BART.

*Governor General in Council, &c. &c. &c.*

HONORABLE SIR,

I do myself the honor of laying before you, the second sheet of my late Survey of Rivers. It appears from the result of this part of my work, that the Ganges has made considerable encroachments in two places, viz. near Sooty, where the distance across the neck of land which divides it from the Baugrutty is now somewhat less than a mile; and towards Bomeneah, the distance across from that place to Bogwangolah being reduced to less than six miles; the latter (which is a considerable Grain Market, and from which the city of Moorshedabad is principally supplied) having changed its site, according as the great River has continued to encroach upon it. The bank at Bogwangolah is now tolerably firm, but as the Stream still bears upon it, and strikes with peculiar force on a steep and rumbling [crumbling] bank below that place, it is probable that the encroachment may yet continue a considerable time.

The near approach of the Ganges to the City of Moorshedabad, suggests the idea that a Cut to connect it with the nearest Reach of the Cossimbazar River might be attended with more advantage than any other which has of late been proposed; as, from the accessation of water which might be expected to flow in through this channel, it is possible that the lower part of the Baugrutty might be continually kept open, in which case a communication would be established with the great River at all Seasons.

The third and principal sheet of this Survey is now nearly completed, and I have the honor to present with the accompanying, the results of such astronomical observations as were taken for the correction of the whole.

I am with great respect,

Honorable Sir,

Your most obedient and humble servant,

CALCUTTA,
*30th September*, 1797.

*(Signed)* R. H. COLEBROOKE,
*Surveyor General*

(A true Copy.)

*(Signed)* R. C. FAITHFULL,
*Secretary.*

# E 58.

[*Minute, Dated 20th January, 1795, by the Honorable Sir John Shore, Bart, Governor General of India in Council.*]

(Copy.)

The communication between Calcutta and the Upper Provinces during Seven months of the Year, is only practicable by the Sunderbunds, a tardy and dangerous Navigation ; and it is by this Route that the Investment of the Company is brought to Calcutta from November to the beginning of the Rainy Season ; and that by which Stores of every kind during the same interval must pass.

From a consideration of the manifest inconvenience attending this mode of communication, and the solid advantage in point of expense, time, and security, which would be gained by a direct connection between the Ganges and that branch of it called the Hoogly River, I thought it my duty to take measures for ascertaining the practicability of another communication, which accident has brought forward to notice within these three years. It was suggested to me, that a Creek called Jubboona, which falls into the Hoogly River nearly opposite to Bansbarya, joined the Issamutty River at no great distance. That this River was connected with another named the Howleah, and this last with the Ganges, and that at a moderate expense the whole might be made navigable at all Seasons; upon this suggestion, I directed the Surveyor General to depute one of his Assistants to ascertain how far it was well founded, or if there were any other practicable communication, and his Report accompanied by Plans and Sections, I now lay before the Board ; the following remarks are extracts from it, &c.

The general result is more in favour of a communication between the Hurdum and the Ganges by the Howleah River, than by the Channel of the Jubboona, and if this can be effected by opening a Cut of three miles only, I have no difficulty in asserting, that the expense of it would be most amply compensated in a very short time, by the advantages gained. The Surveyor General, at my request, has made a Sketch of the required Cut and Navigation, which accompanies this Minute. I do not think Lieutenant Hoare's Survey a sufficient ground for undertaking the object in view, but merely as furnishing materials for a further investigation, which I recommend to be made by the Surveyor General, under the following instructions.

That the object of his deputation is to ascertain the existence, or practicability, of a communication by water between the Hoogly River and Ganges, at all Seasons of the Year, either by the Channel of the Hurdum and Howleah, or that of the Jubboona, Issamutty, and Howleah, following the course of both, as delineated in the Sketch which he has himself prepared. That if the Navigation of both should be found practicable, he will ascertain the comparative advantages of one with the other; taking into consideration the length of the Navigation, the expense of making it practicable, and the probability of its continuing so, after having been once made; in doing which he will naturally advert to the level of the country, the rapidity of the Current, the effect of the tides, procuring from Natives on the spot all possible information as to the former state of the Channels which he is appointed to Survey, and the alterations which may have taken place in them, and the causes of such alterations. Having completed his Survey, he is to deliver in his Report to the Board.

On a reference to an Abstract of the Grant to Mrs. Tolly, I find no clause, that in my opinion opposes the proposed communication, if it should be found practicable. The Company preclude themselves during the period of the Grant to her, viz., "from July, 1st 1789 to July 1st 1804, from giving any power or authority to any other to make any Cut or Canal from the Salt Water Lake to the River Hooghly, or parts adjacent thereto, so as to interfere with, or in any manner affect the tolls, customs, or duties granted to Mrs. Tolly." That the proposed communication may affect them in some degree, cannot be doubted; but it is widely distant from the Salt Water Lake, and I see no reason in equity for renouncing advantages of great consequence to the Company, and to individuals, for the benefit of the Proprietor of the Canal, who has derived, and will still continue to derive, very ample emoluments from the possession of it. Grants of this nature, conferring gratuitous benefits to an amount far exceeding all reasonable claims of compensation, should be construed strictly, whenever a question arises upon it, in which the interests of the Grantee stand in opposition to those of the Public. But upon this point I propose a reference to the Advocate General.

The period of the expiration of this Grant is still remote, but I cannot omit this opportunity of recalling the attention of the Board to a clause on [in] it, which should never be lost sight of, and which provides that at the expiration of the Grant, the Canal is to be delivered over to the Company for their benefit and convenience in a completely navigable state; and on this point, I propose that an extract of the Grant, as far as it relates to the mode in which the banks of the Canal and the Canal itself is to be kept, be communicated to the Surveyor General, and that it be made a Standing Order for him to Report annually in the month of December, or January, how far the provisions in the Grant are in this respect granted to.

I propose also, that the opinion of the Advocate General may be added as to the following point—Whether by the terms of the Grant, Mrs. Tolly is or is not precluded from erecting huts or buildings on the banks of the Nullah; if he is of opinion that she has authority by the Grant for this purpose, she is to define the extent of such authority. This reference is suggested by observing a variety of huts on the northern banks of the Nulla, between the two bridges, and from the Belvadere Bridge Eastward at the extremities of the Esplanade, which are certainly a nuisance, whether they are to be deemed an encroachment or not.

PUBLIC DEPARTMENT, *(Signed)* J. SHORE.
*20th January*, 1795.

(True Copy,)
*(Signed)* R. C. FAITHFULL,
*Secretary.*

# E 59.

(Copy.)

To G. H. BARLOW, ESQ.,

*Secretary to Government.*

SIR,

Having completed, with the aid of Ensign Blunt my Assistant, the Survey of Tolly's Canal, I now beg leave to lay before the Honorable Board, agreeably to their Orders of the 16th ultimo, my Report on the present condition of that Canal, with an Estimate of the probable expense that might be required to clear it, so as to render it navigable for the present, as well as the charges which might be incurred in keeping it open for every ensuing year, or until such time as the gradual accumulation of the mud may render it necessary to clear it out effectually again.

This Nulla, from its outlet to the Hoogly River, to where it enters the Soonderbunds at the village of Tingerya, is in length thirteen miles, and six furlongs. The tides flow into it at both extremities, but with greater force from the Hoogly, the effect of which double influx has a perpetual tendency of depositing the mud with which the waters of the Hoogly River in particular are so thickly impregnated; and it would appear by the Reports of the Natives inhabiting the banks, that since the first establishment of the Canal by Major Tolly, the soil has actually gathered in some parts to the depth of three or four feet.

By the accompanying Plans and Sections, it will appear that a considerable portion of the Nulla, probably the whole space that was originally dug to form the communication, is now either dry at low water, or retains so little water during the ebb as to be almost impassable for a Dhinghy; upon the whole it is barely navigable for any boats during the Neap Tides, and can only be passed through by those which are deeply laden during the highest springs.

To clear out the Canal in such a manner as to restore it to its former condition, and to render it an easy thoroughfare for boats at all Seasons, will be attended with a degree of labour and difficulty, equal at least to what the original Projector had to encounter, and with an expense little short perhaps of the sum he expended—to form an estimate of which, it will be necessary to take into consideration the following circumstances:—

*First.*—It will be absolutely requisite to dam up the Nullah at both extremities, in such a manner as to resist the immense pressure of the waters from the Hoogly River and Sunderbunds during the highest spring tides.

*Secondly.*—It will be necessary to drain off the water, which in spite of every endeavour to shut it out during the construction of the Bunds, must remain in the bed of the Nulla, and as temporary sluices cannot be formed, but at a great expense, and would be afterwards rendered useless, recourse must be had to bailing, and various other contrivances.

*Thirdly.*—As there are several water-courses and drains which communicate with this Nulla, among which the Cotta Colly Creek, from the *Fresh* Water Lake, is the most considerable ; it will be necessary to close up by Dams, to prevent any sudden influx of water, which in case of rain, might considerably retard the labourers during the progress of the work.

*Fourthly.*—As it is probable the bed of the Nulla contains many springs, it will be utterly impossible to counteract these in such a manner as to leave the channel dry, or in such a state as might enable the people to work with ease—the labour and difficulty therefore, that must attend the excavating a prodigious quantity of loose mud, comparatively with solid earth, must be obvious.

Having computed the mean quantity of soil that should be removed from the bed of the Nulla, and maturely considered every other circumstance, I am of opinion, that the work cannot be executed for a sum less than Fifty-eight thousand, nine hundred and forty-five Sicca Rupees, and that it will require Four months of the ensuing Dry Season to carry it into effect, after which there is every reason to hope that the Nulla would continue navigable for ten years ; and that the annual charges to be incurred during that period would be inconsiderable. About six thousand Rupees per annum would be sufficient for sloping the banks, removing the fragments of Buildings that might occasionally fall or be thrown into it, as well as for the removal of sunken boats, and the clearing such points as might casually be impeded by floating timbers, rafts, or other nuisances, for which a small establishment of people would be necessary.

I have the honor to present herewith the accompanying Plans and Sections of the Nulla, executed chiefly by Ensign Blunt, who, having had the greatest share in the Survey, I would beg leave to recommend his being rewarded with the usual allowance of a Surveyor of Rivers for one month.

I have the honor to be,

Sir,

Your most obedient, humble servant,

(*Signed*) R. H. COLEBROOKE, *Captain*,

*Surveyor General.*

CALCUTTA,

*30th June*, 1796.

(A true Copy,)

(*Signed*) R C. FAITHFULL,

*Secretary.*

# E 60.

(Copy.)

To G. H. BARLOW, ESQ.,

*Chief Secretary to the Government.*

SIR,

Having frequently reflected on the possibility of improving the Inland Navigation of Bengal, by keeping open during the Dry Season the Cossimbazar or Jellinghy River; I now beg leave to submit for the consideration of His Excellency the Most Noble the Governor General in Council, proposal for a trial of the method which appears to me best calculated for the attainment of this desirable object.

As the principal cause of obstruction to the free Navigation of these Rivers is referable to the great bodies of sand which are annually thrown into their beds by the Ganges, and which continue to choke up their channels, in different parts, but particularly at the places where they emerge from the great River, until the Rainy Season commences, it is obvious that no permanent excavation could be made to counteract this effect. But so long as the water of the Ganges continues, in the Dry Season, to be drained through either of these Rivers, in a stream ever so scanty, there is a chance of improving the means which nature continues to afford, and it might be hoped, of establishing ultimately, by an annual process, the free communication by water between Bengal and the Upper Provinces, at all seasons of the year.

The difficulty of effecting this may not appear very great, if it be considered that in most of the Reaches of the Cossimbazar and Jellinghy Rivers, there is water sufficient at all times for boats of any size; and that the parts which become unnavigable in the Dry Season, bear no proportion to those which are navigable. It is evident, therefore, that the removal or partial excavation of the shallows, could afford the only means of rendering these Rivers navigable at all times, and as the draught of water for boats of a moderate burden would not exceed two feet and a half, it might possibly be done at an expense comparatively small.

The idea I have long had upon this subject is, that if an iron rake of sufficient dimensions, or any other instrument of that nature, were to be employed to stir up the sand upon such of the shallows as are of inconsiderable length, the current would carry down the floating particles into those parts of the stream, whose depth could admit of their subsiding without detriment. A machine somewhat similar to this, I have lately seen described in a French Treatise on Rivers, where it is said to have been used with considerable success in Holland and in other parts of Europe.

The machine I would use, two models of which I have the honor to transmit, should be about the size of a gun-carriage, with very broad wheels, or trucks, the latter of which might be armed with spikes. A large rake, with iron claws, might be suspended over the axle-tree, with a long lever in front, by which it could at any time be extricated from the sand. A back lever, of sufficient power, could be applied to the rake No. 1 occasionally, to force the claws into the sand. These Machines would require several yoke of oxen to drag them, instead of horses, which are used in Europe, and experience might suggest many improvements by which they would be rendered more effectual.

The process alone would not, I conceive, be sufficient to open the principal shoals at the head of the Cossimbazar and Jellinghy Rivers, these being frequently of such

considerable length, that the sand would probably settle again before it could reach the deeper parts of the Stream. For this part of the operation, I would propose that an adequate number of Bildars, and Cooleys be employed to excavate a part of the channel to the depth of two feet, and of sufficient breadth for two of the largest Boats to pass abreast; after which there might be reason to hope that with the help of the Dragging Machines, the current of the River would deepen it still more. It would be necessary, in order to prevent the too great expansion of the stream, to enclose it between two mounds or dykes, which could be thrown up from the sand to be excavated—thus forming a temporary Canal within the natural bed of the River, as represented in the Plan and Section, which I have the honor to transmit.

The most likely impediment to an attempt of this sort would be quicksands occurring in the places to be excavated; but it remains yet to be proved, how far such do actually exist in the parts to be deepened, and whether it might not be possible to overcome even that difficulty.

As the Jellinghy River is by much the shortest in its course, it would seem to offer fewer difficulties in the way of this undertaking. Its present communication with the Ganges is through the Calculia, the head of which River is situated a little below Bogwangolah, and only 20 miles from the city of Moorsheedahbad, from which place, and from Berhampoor, labourers and utensils could easily be procured.

The whole process of the experiment would probably last but a few days, and I should hope that if it were successful, there would be no occasion for a repetition of it during the remainder of the Dry Season, as any new gatherings of sand need not be apprehended.

It might be necessary to retain a few of the people only, till such time as the River had subsided to its lowest level, in February or March, when the Dragging Machines and other implements, could be laid up in a shed near the principal spot, to serve again, by which the expense of the following year would be considerably lessened.

I could not pretend to form an Estimate of the total Expense of the Scheme, previous to Surveying the Jellinghy and Calculia, taking the necessary Levels, and Sounding these Rivers throughout; but should Government be pleased to depute me on the Survey, and to authorize me to prepare before the ensuing month of November, as many of the Dragging Machines as might be necessary for a complete trial of their effect, I could proceed at the time stated, with implements requisite for the undertaking, where a few weeks might suffice for determining whether the object in view is attainable by the means which I have the honor to propose.

I have the honor to be,
Sir,
Your most obedient, humble servant,
*(Signed)* R. H. COLEBROOKE, *Major*,
*Surveyor General*

SURVEYOR GENERAL'S OFFICE,
12*th May*, 1801.

A true Copy.
*(Signed)* R. C. FAITHFULL,
*Secretary*.

# E 61.

To JOHN LUMSDEN, ESQ.,

*Chief Secretary to the Government.*

SIR,

I have lately been honored with yours of the 13th ultimo, requesting me to furnish an Estimate of the probable expense of an experiment to keep open the Jellinghy, and to proceed at the proper season to Survey that River, as well as to carry the experiment into effect

Having duly reconsidered the proposal which I had the honor to submit last year to His Excellency the Most Noble the Governor General in Council, I have now reason to think that the use of about thirty flat bottomed boats will be indispensably necessary, and that, in case the difficulties of opening that River should not, upon the Survey, appear unsurmountable, the assistance of about 500 Coolies, to be employed in deepening the bed of that River, in the places where it is usually obstructed by shallows, but particularly at the place where it comes out of the Ganges, should be allowed me for that purpose.

With these additional helps, it might be possible, I should hope, to keep open the Jellinghy River during the ensuing Dry Season, but in case it should be practicable to do so, a renewal of the process should be made to effect it on every succeeding year, as in consequence of the periodical inundations, fresh accumulations of sand must be expected

I have confined the present Estimate to one Dragging Machine, but [it] is probable that a greater number would be [required] on future occasions, or that one might be necessary for each shallow.

I beg leave to acquaint you that the proper Season for setting out upon the Survey will be about the beginning of October next.

I have the honor to be,

Sir,

Your most obedient, humble servant,

(*Signed*) R. H. COLEBROOKE,

*Surveyor General.*

SURVEYOR GENERAL'S OFFICE,

*17th August*, 1802.

A True Copy,

(*Signed*) R. C. FAITHFULL,

*Secretary.*

# E 62.

(Copy.)

J. LUMSDEN, ESQ.,
&c &c. &c.

DEAR SIR,

I have drawn up the accompanying Estimate, on the presumption that Government would have no objection to my making every exertion to keep open the Jellinghy River during the ensuing Dry Season, provided the difficulties should not, upon the Survey of it, appear so great, as to deter me from the attempt.

The work to me is entirely new, and is almost novel of its kind in Bengal. It is therefore, with some diffidence, that I undertake it, and lay before His Excellency in Council the accompanying Estimate, in which some things may be found by experience to have been overrated, and others again to have been undercharged. The overplus on one hand, may in that case be made to counter-balance the deficiency on the other, and whatever may be the result of the undertaking, you may depend on my giving in a faithful account of the disbursement of the money, should my estimate be approved.

The addition of the flat bottomed boats only lately occurred to me, and I prefer such to the common Dinghies of the Country, on account of their drawing less water, by which means they can be brought to the very spot where the sand is to be lifted, and being filled, can be made to drop down with the stream to such places as it may be found convenient to throw out the sand. Mr. Waddell, has been so kind as to undertake to make up the Dragging Machine, as well as two of the boats, and one of the latter I have now in hand, at my own house.

I am, dear Sir,
Yours very obediently,

*17th August*, 1802. *(Signed)* R. H. COLEBROOKE.

P. S.—I have rated the Cooleys at 1 Rupee more than is usual, I understand, as the work will be extremely laborious—the Dandies of the flat-bottomed boats likewise.

(True Copy.)

*(Signed)* R. C. FAITHFULL,
*Secretary.*

# E 62. *a.*

## *Estimate of the probable Expense of an experiment, to keep open the Jellinghy River in the Dry Season of 1802-3.*

| | |
|---|---|
| For one Dragging Machine to be made after the Model, with its carriage yokes, and tackle complete, .. .. .. .. .. .. ... .. | 450 |
| For 30 strong Bullocks to put the dragging Machine in motion @ 20 each, | 600 |
| For 15 Bullock Drivers to be paid for 4 months, during which the Machine may be tried in different parts of the River @ 4 each, .. .. .. | 240 |
| For feeding the Bullocks during ditto @ 4 each, .. .. .. .. .. | 480 |
| For one small accommodation boat to go into shallow water, to enable me, or an Assistant, to follow the track of the Dragging Machine, and superintend the workmen, .. .. .. .. .. .. . ... .. | 200 |
| For 30 flat bottomed boats to be employed upon the shallows in excavating the sand @ 40 each, .. .. .. .. .. .. .. .. .. | 1,200 |
| For 60 Dandies in 4 months for ditto ditto, .. .. .. .. .. | 960 |
| For 20 Bildars to be employed during the whole time of the Survey and experiments, at 5 each, .. .. .. .. .. .. .. . | 400 |
| For 1 Tindal, and 10 Lascars during ditto ditto, .. ... .. .. ... | 280 |
| Boat hire for transporting the Dragging Machine, tents, entrenching tools, to the head of the Calculia River, and for the accommodation of a small Escort of Lascars and Bildars, @ 300 per month, .. .. .. .. .. | 1,200 |
| For 500 Cooleys to be employed during one month in clearing the head of the Calculia and other shallows of the Jellinghy River, .. .. .. .. | 2,000 |
| For 500 Iron Shovels, at 2 Rs. each, .. .. .. .. .. .. .. | 1,000 |
| For 1 Writer and 1 Sircar during 4 Months, ... .. .. .. .. | 200 |
| For contingencies including levelling staves, kodallies, sounding lines, bamboos, ropes, and repairs, &c &c .. .. .. .. .. .. .. | 790 |
| Total, *Ten thousand* Sa. Rs. | 10,000 |

SURVEYOR GENERAL'S OFFICE,
17*th August*, 1802.

(*Signed*) R. H. COLEBROOKE,
*Surveyor General.*

(A true Copy)

(*Signed*) R. C. FAITHFULL,
*Secretary*

# E 63.

*Memorandum.*

It appears from correspondence and records in the Surveyor General's Office, that the passage called Lieutenant Morrieson's Cut, between the Kallindah River and Barrah Koolliah, was first projected by Lieutenant Morrieson, in the month of March, [(a)]1812.

(a) Vide Letter from Lt. Morrieson to Major General Garstin, Surveyor General, dated 2d March 1812.
(b) Vide Letter to Major General Garstin, of this date

On the [(b)]19th April of that year, Lieutenant Morrieson having been nominated by Government to Superintend the Canal, made application for an advance, and stated that the grubbing of boats would add to the expense of undertaking beyond what the Estimate comprehended.

On the 18th May, 1812, the immediate commencement of the Cut having been directed by Government, Lieutenant Morrieson applied for a specific advance of Sicca Rupees 3,000.

On 11th December, 1812, Lieutenant Morrieson represents difficulties encountered from the fears of the workmen ; loss of two men by tigers ; states 200 Felons would finish the Cut in two or three months. Having cleared the Jungle, found the distance less than previously calculated, and therefore expected the expense would not exceed Sa. Rs. 3,000.

(c) Vide Letter to Major General Garstin, of this date.

On the [(c)]3d March, 1813, states the work to be nearly closed, and adverts to a further advance of cash.

(d) Vide Field Book No 2.

By extract from Lieut. Morrieson's [(d)]Field Book, date 9th March 1812, he was on that date at Dum-Dum, preparing the proposition for the Canal, to be submitted to Government.

(e) Vide Field Letter Book, No 3.

"[(e)]24th October, 1812, from this time to the end of the month occupied in arranging matters concerning my Canal. The Natives have a great dread of this part, on account of tigers. Frequent attempts have been made to establish the village of Kosbass and Syacottie, but without effect, the settlers being driven away by their dangerous neighbours."

(f) Ibid.

"[(f)]19th November, 1812, reached Kosbass, and superintended the clearing the Jungle to the end of the month."

(g) Ditto.

"[(g)]10th December, 1812, dropt down to Kosbass, found it advisable to run up to Busserhaut Thannah for work people, which the Zeemeendars are backward to furnish. Returned to Kosbass on the 16th, having collected people and also bamboos for a fence to protect the workmen from the tigers"

(h) Ditto.

"[(h)]27th December, 1812, finding it impossible to procure more than 50 or 60 workmen, while the harvest was getting in, went to Calcutta to collect people."

(i) Ditto.

"[(i)]10th February, 1813, at my Canal, where I remained until the 24th of the month"

(j) Ditto.
* This should have been 28th Feb. but the error is in the Field Book. *Sgd.* R. C. F.
(k) Vide Field Letter Book, No. 3.

"[(j)] *28th March 1813, found the Canal in a great state of forwardness; it will very soon be ready to open"

"[(k)]1st March, 1813, off the end of my Canal, busily employed until the 4th; then went round to the Kalindah River, and again returned to Kosbass."

(l) Ibid.

"[(l)]9th March, 1813, opened my Canal, the flood made strong into it from the Kooliah, and the ebb returned through it from the Kollindah [Kalindah]."

This is the only history I have been able to collect from the Surveyor General's Office; but I shall now try the Chief Engineer, with whom it is possible the original proposition may be found. It can be collected from the foregoing, that the labour was not commenced on until November 1812; that frequent obstructions occurred from a want of workmen; but that still it was completed on the 9th March 1813, a period of only *four* months.

(*Signed*) R. C. FAITHFULL,
*Secretary*.

SECRETARY'S OFFICE,
CHOWRINGHEE, No. 30,
*4th October*, 1821.

# E 64.

*Resolved* [1] *accordingly, to record their Abstract General Conclusions on the subject, as follows.*

(1) Paper E para 7

## ABSTRACT GENERAL CONCLUSIONS.

The inquiries of the Committee tend to confirm all the material facts urged by Lieutenant Schalch, in favor of his Plan.

The Committee are of opinion that any attempt to connect the Ganges with the Hooghly River, by a new Canal from Rajemahal,* or its vicinity, would altogether fail of success.

*One of their members, Mr. Gordon, proceeded in company with Lieut. Schalch, to examine that part of the country, and to ascertain the nature of the soil, and the levels; and Mr. Gordon concurs in the opinion here stated.

They find that the channels of the Bhagrutty, the Jellinghy, and the Matabhanga, have been frequently obstructed during the whole, or a part of the months of February, March, April, and May; that the degree of obstruction has varied materially, not only in different years, but in the several channels in the same year; and that the Navigation has experienced less obstruction in the last two years, than in those preceding it.

This circumstance however, affords no assurance that this advantage will be permanent; but the Committee entertain hopes, that the measures in progress under the superintendence of Mr. May, may hereafter, in some degree at least, facilitate the navigation of the Matabhanga passage, during the Dry months.

But whether this hope be realized, or not, they are disposed to consider the advantages of Lieutenant Schalch's Plan, with reference to the Commerce of the Eastern and South-Eastern Districts of Bengal, rather than to that of the Western and Central Provinces under this Presidency, and they are of opinion, that, without any advertence to the contingent benefits which may probably result to the Commerce of the Western and Central Provinces, from the execution of Lieutenant Schalch's Plan, the undertaking is justly entitled to the support of Government, simply on the ground of its expected results in relation to the Eastern Districts of Bengal.

The Committee are satisfied of the accuracy of Lieutenant Schalch's information, as to the fact of the Chundrah and Gurroy Rivers, which unite in the neighbourhood of

Moosunderpore, in the district of Jessore, being navigable at all seasons by boats of large burthen; that the former has been always so navigable within the memory of man, and that there is every probability of the latter continuing so.

That during Seasons when the Cossimbazar, Jellinghy, and Matabhanga Rivers are closed, Boats from the Upper Provinces, as well as from the Purneah, Dinagepore, Nattore, and other Districts in that vicinity, can safely and beneficially follow the route of the Chundrah, to Coolna, in the Sunderbunds.

Boats having to proceed to Calcutta from the Eastern Districts of Bengal, would, of course proceed in preference through the more Southern channels of the Sunderbuns; Lieutenant Schalch's Plan does not embrace the consideration of any measure for improving the Navigation by the Chundrah or Gurroy channels, or by the more Southern channels above adverted to, as far as Coolna; and the Navigation by either route to the latter place, seems to be sufficiently safe, and not to require any expenditure for its improvement.

The dangers, difficulties, and embarassments alledged to be experienced in the Navigation of the ordinary Sunderbun passage from Coolna to the Salt Water Lake and Tolly's Nullah, are fully confirmed by the information received by the Committee.

The insufficiency of the channel of Tolly's Nullah, for the Trade in its present state, is justly described by Lieutenant Schalch

The connecting Canals proposed to be excavated between Coolna and the Salt Water Lake, appear to the Committee to be easy of execution, and to promise very considerable advantages in the several points noticed by Lieutenant Schalch.

The Committee think that a Canal should be dug from Deacol to the Juboona, opposite to Hoosunabad, and that the cut in question, forms a very important and essential part of the Plan.

The Committee are of opinion, that the Jungle which will occasionally be found on the side of the proposed Canals from Coolna to the Salt Water Lake, as well as on the side of the natural channels in the route suggested, should be cleared to a considerable distance on both sides of the route, and that the tracking paths should be at least 30 feet broad on each side, and as much broader generally as circumstances may admit.

The tract of country through which the new Canals will pass, is little known to Europeans; and we have failed to obtain any material information on matters of local detail, connected with that part of the country. We found nothing however, calculated to shake our confidence in the accuracy of Lieutenant Schalch's deductions, as to the levels of the Country, the course of the Rivers, the probable effects of the Tides, the facility of excavating the Canals, and their duration in an efficient state when constructed.

Tracking ground to any extent may be obtained for nothing, in this part of the line. (*Signed,*) J. S.

Neither do the Committee see any reason to doubt the general accuracy of the Estimate, for the expense of this portion of the work, except in as much as it may be increased by the augmented width proposed to be given to the tracking ground on each side.

Allowing for that increase, the expense of improving the inland Navigation from Coolna to the Salt Water Lake, may be roughly estimated at 2,80,000 Rs.

The chief advantages which would result from the execution of that part of Lieutenant Schalch's Plan are, that the length of the passage at present followed through the Sunderbuns, would be materially diminished; that considerable dangers and difficulties experienced in the present route, would be avoided; that the expense of transporting

goods would be diminished; and that Commercial intercourse and enterprise would be proportionately encouraged.

Another contingent advantage, which Government might reasonably calculate upon, would be the increase of cultivation in the vicinity of the new route.

Some notice should be taken of the Petition forwarded by Mr. Dale, the Commissioner of the Sunderbuns and of Lieutenant Schalch's remarks on the objections urged by the Petitioners.

N. B. The Petition will be translated and sent to Capt. Faithfull, with Lieut. Schalch's observations written in the margin.

The Committee would however, be disposed to attach comparatively little importance to the execution of that part of Lieutenant Schalch's Plan, if it were considered above, and unconnected with the remaining portion of his suggestion; viz., The improvement of the channel through the Salt Water Lake and Eastern Canal, and the extension of the communication by a Canal at the back of the Circular Road, to join the Hooghly River at Chitpoor

On this branch of the Scheme, the Committee are enabled to offer an opinion on more satisfactory grounds than on the former, in as much as they have had the means of obtaining the sentiments of gentlemen whose acquirements and local knowledge, qualify them to judge, and as several of the Members of the Committee have had an opportunity of satisfying themselves personally, with regard to some points of importance, in that portion of the Plan.

The excavation of the proposed Canal through the Salt Water Lake to join the Eastern Canal, seems to the Committee essential. It was the opinion of the late Mr. Blechynden, that the expense and difficulties attending that measure would be greater than calculated upon by Lieutenant Schalch, and that it would be preferable to carry the Canal round the Lake, and to unite it with the River at Barnagore

Such an alteration of the plan however would completely defeat many of the most important and beneficial objects contemplated by Lieutenant Schalch, and a careful consideration of the Question, has confirmed our judgment as to the superior advantages of the original scheme.

Lieutenant Schalch's Estimates do not include any provision for widening the channel of the Eastern Canal, for sloping the banks, and for improving and lowering the road on its North side,--all these measures however, appear to the Committee requisite.

The Committee are of opinion, that the Canal at the back of the Circular road, by which it is proposed to connect the Eastern Canal with the River Hooghly, should be carried at an average distance of from 1,500 to 2,000 feet from that road. At that distance the ground may, in the judgment of the Committee, be procured at even a lower average price than that of 60 Rs per cottah, assumed by Lieutenant Schalch in his Estimate. The road on the inner side of the Canal should be 60 feet wide, instead of 30, the width proposed by Lieutenant Schalch.

The Estimates of that Officer provided for the construction of five large bridges over this part of the Canal, at an expense of 20,000 Rs. each.

Supposing that the experiment now in progress, of throwing a Suspension Chain Bridge over Tolly's Nullah should succeed, the Bridges over the Canal should be constructed on the same principle, and they may, in that case, be made sufficiently commodious without exceeding the estimated expense.

It may hereafter be found necessary to add 3 or 4 smaller bridges at suitable intervals

between the large bridges, to facilitate the communication, and for the convenience of foot passengers, bullocks, &c.

Qy. I do not find that the dimensions of this Basin are given, or the expense estimated for by Lieutenant Schalch.
(Signed.)
W. B. BAYLEY

The formation of a Basin near the head of the Canal where it unites with the Hooghly River, seems highly desirable, and the persons whom the Committee have consulted on this question, are unanimous with regard to its probable advantages.

The Committee are satisfied that the Drainage of the City of Calcutta will be materially improved and facilitated by the construction of the Canal, provided due means be taken to prevent the River from flowing into the Canal during the Rainy Season. The mode in which Lieutenant Schalch proposes to effect this object, seems to be generally approved, and as far as we have the means of judging, it will perfectly secure the object in view.

We are not of opinion, that Lieutenant Schalch's Plan for conveying the filth and ordure of Calcutta through tunnels to the new Canal would answer. The objections urged by the Lottery Committee, and by other persons, satisfy us that the experiment ought not to be tried.

We think, however, that the construction at proper intervals, of Tunnels of the description noticed by Mr. Blechynden, from the Chitpore road to the new Canal, is highly desirable, and that they would tend greatly to improve the Drainage of that part of the Town Government may probably think it right to authorize the Magistrates to construct one tunnel of that description on the side of the Machwa Bazar road, between the Machwa Bazar road and the Loll Bazar, as an experiment calculated to shew how far the expense of such a system of Drainage would be warranted by the actual benefits derived from it.

In noticing the Total Expense likely to be incurred in the completion of the whole of the proposed Work, the Committee find it necessary to remark, that they have failed to obtain that accurate information on many points, which alone would enable them to submit their sentiments to Government, with a confidence in their accuracy.

Lieutenant Schalch's Estimate for the whole of the proposed operations from Coolna, in the Sunderbunds, to the Salt Water Lake, amounts to Rupees 2,30,703, including the cost of the Canal from Deacol to Hoosunabad, which Canal the Committee consider essential to the complete success of the general Plan.

The average rate assumed as the cost of excavating the Canals being the same as that incurred in digging Tanks in Calcutta and its vicinity, is probably higher than that which will be incurred in many parts of the route, and is not likely to be exceeded in any.

The assumed rate of clearing jungle, and brushwood, viz. 2 Rs. a beegah, appears also to be sufficient.

The assumed rate of 10 Rs. per beegah as the average cost of land on the line between Coolna and the Salt Water Lake, will probably cover the actual expense. In some parts of the line where the Canal will approach villages and cultivated ground, the rate will be higher; in others, where it passes through waste or jungle land or jheels, the requisite ground may be obtained at little or no expense.

It is probable however, that a quantity of ground exceeding that estimated for, will be necessary, if the tracking paths shall be made, as proposed, of the breadth of 30 feet, including every contingency; however, the Committee are of opinion, that this part of the Plan may be safely estimated as not likely to exceed Rupees 2,80,000

The expense of bunding in, and of deepening the Channel through the Salt Water Lake, and of deepening the Eastern Canal, is calculated by Lieutenant Schalch, at 17,387 Rupees.

We have already observed, that the rate of 60 Rupees per cottah, assumed as the probable cost of the Ground which will be required for the Canal and Road, at a distance of 1,500 or 2,000 feet from the Circular Road, appears sufficiently large.

If however the breadth of the road should be assumed at 60, instead of 30 feet, the expense of that portion of the Plan will be increased from 48 to 96,000 Rupees.

Lieutenant Schalch's Estimates do not include any provision for making the Road, or for constructing the proposed bund for excluding the River during the Rains, or for Drains. If the road be for the present made kucha only, the cost of these works may be roughly assumed at 60,000 Rupees.

The expense of five bridges over the Canal, at the rate assumed by Lieutenant Schalch, would be 1,00,000 Rupees.

On the foregoing principles, the expense of completing the projected works from the commencement of the Salt Water Lake, to the junction of the New Canal with the River Hooghly at Chitpore, would stand as follows:—

| | |
|---|---|
| Bunding in and excavating the channel through the Salt Water Lake, and deepening and improving the Eastern Canal, . .. .. .. Rupees. | 40,000 |
| Excavating the Canal from the head of the Dhurrumtollah to the River at Chitpore, .. .. .. .. .. .. .. .. .. | 1,23,350 |
| Cost of Beegahs 270 of Ground, for the Canal and Road at 60 Rupees per cottah, | 3,24,000 |
| To Five Bridges over the Canal, .. .. .. .. .. .. | 1,00,000 |
| Making the Road, Bund, and Drains, .. .. .. .. .. .. | 60,000 |
| | 6,47,350 |
| Add, expense of Works from Coolna to the Salt Water Lake. .. .. .. | 2,80,000 |
| Total, .. .. | 9,27,350 |

To this sum may be added, 1,00,000 Rupees as the expence of superintendence and establishment, and other contingencies, and the total outlay on the part of Government would be about Ten Lacs, or Ten and a half lacs of Rupees, without including any charge for interest on the outlay.

It forms a material part of Lieutenant Schalch's Plan, that, in addition to the Ground required for the Canal, and Road (being in width near 200 feet) a considerable portion of ground lying along the inner or Western side of the Road, be at the same time purchased. That officer infers that the surplus Ground so purchased, may be resold after the Canal and Road shall have been opened, at a profit of 220 Rs. per cottah. The Committee are not of opinion, that the grounds on which Lieutenant Schalch draws this inference, will warrant so sanguine a calculation. The Committee would recommend that a quantity of ground, averaging about 100 feet in breadth, be purchased along the whole extent of the inner line of the road, which would amount to 135 Beegahs.

This surplus ground might be eventually resold at a profit of 80 Rs. a cottah, or 1,600 Rs. per Beegah. The total profit would be about 2,16,000 Rs., and deducting that amount from the Estimates above given, the net expense of the undertaking would be reduced to about Eight Lacs of Rupees.

The Committee feel assured that a considerable Toll might be levied on Boats passing through the new channel from the entrance of the Salt Water Lake towards the Hooghly, or from the Hooghly to the Salt Water Lake. This channel would undoubtedly be generally used in preference to that by Tolly's Nullah.

Some reduction would doubtless take place in the sum now levied by toll in Tolly's Nullah, but a considerable increase in the general amount of commercial transport might reasonably be anticipated, beyond that which now enters the Salt Water Lake or Tolly's Nullah. We cannot offer, upon accurate grounds, an Estimate of the probable amount of Tolls which might be realized beyond those now collected in the Eastern Canal and Tolly's Nullah, but from the general information before us, we think it might be safely estimated in the course of two or three years at a net increase of 50,000 Rs. per annum.

We think also that an equal sum might be realized from a toll on boats availing themselves of the proposed Harbour, near the Hooghly, whether for safety from the weather, or for the purpose of discharging their Cargoes.—Deducting, from the supposed proceeds of One Lac of Rupees, the sum of 40,000 Rs. for charges of superintendence and repairs, the outlay of Eight Lacs of Rupees would give an annual income of 60,000, or about $7\frac{1}{2}$ per cent.

In these calculations, the Committee have purposely assumed a higher outlay and a smaller return, than circumstances may appear to warrant. They are solicitous to avoid the hazard of future disappointment, and they think the plan holds out so fair a prospect of great and general advantage to the public interests, that the Government will be disposed to encourage the plan, if they should be satisfied, that in the early years of its operation, it will *give* a return of 6 or 7 per cent. on the outlay, with a reasonable certainty of a much larger profit, at a future, and not very remote period.

(1) Paper E. para. 6

# E 65.

To H. SHAKESPEAR, ESQ.,

*President of the Special Committee to Examine Lieut. Schalch's Plan.*

Customs.

SIR,

I am directed to acknowledge the receipt of your letter, dated the 27th ultimo,* and to transmit to you the accompanying replies of the Board of Customs on the points referred for their consideration on the 18th of January last.

I have the honor, &c.

(*Signed*) H. SARGENT,
*Secretary.*

BOARD OF CUSTOMS,
SALT & OPIUM,
*The 8th August,* 1822.

# [1]E 65. *a.*

(1) Paper E. para. 42.

List, **No. 5.**

1. The Board are of opinion, that the advantages of Lieutenant Schalch's Plan, are very doubtful, in as much as a toll would probably prevent the Native Importers from the Eastern Provinces from availing themselves generally of the proposed Canal ; at all events, until very decided advantages have been practically ascertained, the obstacles which the prejudices of the Natives so invariably oppose to every new plan, are not likely to be overcome, so as to induce them to frequent the new channel.

The Board do not think, that the saving in point of time of a few days, between the present and the proposed route, would constitute any very decided advantage in the opinion of the natives. Its principal, and certainly its strongest claim to support, consists, the Board think, in its opening a communication with the Districts East of Calcutta for the transit of Merchandize, free from the risk of loss of lives and property, and the inconveniences which attend the Navigation of the Great Sunderbunds, through which the Trade of the Eastern Districts proceeds to and from Calcutta, and which are pointed out in page 3 of Lieutenant Schalch's Memoir.

In the absence of the requisite Data, the Board are precluded offering any opinion on the calculations framed to shew the Revenue the proposed Canal will yield. It occurs to them however, to observe, that a reduction in the Revenue at present derived from Tolly's Nullah, must inevitably result from it.

2. The returns from the Inland Custom House shew that in the years 1819. 20, 21, 2,268 boats* arrived from the Western Provinces by the way of the Sunderbunds. The Board are therefore of opinion that the proposed line of Canals might afford some facility to Trade, should the Merchants feel disposed to avail themselves of it. Indigo from the Western Provinces, is generally brought down in small boats, before the Baugrutty is closed up, and the supplies of Europe Goods for Up-Country consumption are almost entirely dispatched during the Rains, when the S. E. winds prevail, and it is improbable that they would ever choose the route of the proposed Canal.

* Average burthen about 350Maunds each.

Indigo, the produce of the ceded and conquered Provinces, and that from Oude, is seldom imported in any considerable quantity before February ; this and nearly the whole produce of the Eastern Districts, will, there can be little doubt, take the route of the New Canal.

5. The Committee are referred to the Board of Trade for information on this head. The Opium investment comes by the Baugrutty and Hooghly Rivers, in small light Boats. The time of Dispatch being from about the 20th of October to the 20th of Nov. and of Arrival at Calcutta, from the end of November to the end of December. Salt is stored in the neighbourhood of the manufacture, and is transported from thence at the expense of the purchaser. The new Canal would afford facility to the Merchants, who may be desirous of sending their Salt from the Golahs in the 24-Purgunnah's Agency to Maddoo Colah, an extensive Salt Mart in the Jessore District. The Western Provinces are for the most part supplied with Salt from the Sulkeah Golahs, and the Tomlook, and Hidgellee Agency, viâ the Hooghly and Baugrutty.

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# E 65. b.

## List No. 6.

1. The Board apprehend that the advantages in a commercial point of view are greatly overrated in the Memoir, as the several small Rivers branching from the Ganges are seldom so completely shut up, as to impede the progress of small Boats through some one of them; the Baugrutty and Jellinghy are open occasionally throughout the year; the Mattabangah almost always so, for boats of moderate burthen. In 1821, the Baugrutty was open during the Dry Season for boats of from 5 to 600 Maunds, and as Merchants have so arranged their Up-Country Trade as to experience scarcely any inconvenience by a temporary suspension of the direct communication, the Board have not been able to satisfy themselves, that the advantages of the proposed Canal, in a mercantile point of view, would justify the heavy outlay, which the adoption of the Plan would appear to involve. The transit of merchandize from the Eastern Districts would unavoidably be facilitated by the Canal, but even were the whole produce of those Districts to pass through the proposed new Cut, the collections would not amount to any thing considerable, the produce of the Eastern Districts being, generally speaking, less valuable than those otherwise situated with reference to Calcutta.—Silk is never dispatched in large boats, it is so valuable an article, that small light boats are selected for its transportation. The plan of the Canal, if adopted, might indeed occasionally expedite the arrival of Goods, but the Board are given to understand, that a difference of seven days only is allowed between the direct and Sunderbund passage.

2. A Basin or Harbour near Chitpore would undoubtedly afford a desirable place of refuge for Boats after having delivered their Cargoes. Gruff goods, such as Chunam, Grain, Oil, or Oil Seeds, are now permitted to be landed at the outer Ghauts, but the principal Imports are required to be taken to the Inland Custom House Wharf, and almost all the Cotton Boats are obliged to approach Calcutta by the route of the Hooghly, and to land their Cargoes at the Screw Houses, chiefly situated at Seebpore and Howrah. Boats laden with Sugar, Saltpetre, and other bulky articles, would not resort to the Basin, as the expense of land carriage from Chitpore to the Warehouses of the Merchants, situated in the interior of the Town, would be ruinous.

It has been shewn in the preceding paragraph, that loaded Boats would not resort to the Basin, as they could not, for the reasons already assigned, discharge their Cargoes there. With respect to the protection the Basin would afford to Boats so laden from the violence of the Bores, it may be proper to observe, that the larger description of Boats usually come too at Balle khaul, immediately above Calcutta, and there remain until the spring tides (during which only the Bores prevail) take off. In this khaul they are effectually secured from the influence of the Bores, and the violence of the Freshes during the springs in July, August, and September, and the Merchants would not purchase this security by paying a toll in the Basin, when they can obtain it without. The impression on the mind of the Board is, that empty Boats might resort to the Basin, as while there, they could reduce their crews to a Mangy and one or two Dandies, but a heavy toll would induce their Mangies to forego the advantages and security afforded by the Basin.

3. It is out of all reason to expect, that the proposed Canal can be made the channel of *direct* communication between the Ganges and Hooghly at *all* Seasons of the year, or that it will ever be frequented by Boats trading to and from the Western Provinces whilst the Bhaugrutty or Jellinghy are navigable; these Rivers are usually open during five months of the year, and as they offer a more direct, and infinitely nearer, communication with the Ganges than the new Canal, they will be resorted to in preference while open, not only for the whole of the Western, but for no inconsiderable proportion of the Trade from the North-Eastern Districts.

Subjoined, is an Abstract Statement[1] of the value of Merchandize imported into Calcutta from the Western Provinces, during the last four years, agreeably to a Return made from the Inland Custom House. (1) Paper E, para. 39.

| | | |
|---|---|---|
| 1817-18 | Sa. Rs. | 4,69,94,068 |
| 1818-19 | ,, | 3,68,11,526 |
| 1819-20 | ,, | 3,32,40,370 |
| 1820-21 | ,, | 4,12,00,602 |
| | | 4)15,82,46,366 |
| Average, | | 3 95,61,621 |

Estimating the expense of excavating and bringing into use the projected Canal at 10,00,000 Rupees, and supposing that 1-8th[2] of the Inland Imports from the Western Provinces is brought to Calcutta through the new Canal, a toll of 1 Rupee per cent on the value so imported, would produce about 50,000 Rupees per annum, by a contribution on the Trade from the North-West Provinces, which would not be sufficient even to pay the interest in the outlay at 6 per cent. (2) Paper E para 45

4. Supposing all the advantages expected to be derived from the Canal are realized, the expense of transportation will probably be lessened, and time saved; but it does not necessarily follow that the Commerce of Calcutta will be improved, unless indeed the saving of expense is likely to be so considerable, as to induce the Merchants to reduce the price of the necessary articles of consumption, so as to bring them more within the means of the indigent classes of the community and thereby increase their consumption; on such a result however, the Board are not disposed to speculate, since it is more probable, they think, that the merchants will urge the plea of having a toll to pay, as an excuse for keeping up, if not advancing, the price of their Goods. The Coal mine at Sylhet has not been worked for some years; and that worked by the late Mr. Jones near Burdwan, is in a direction to preclude the Coal from the benefit of the proposed Canal.

5. We are informed that there is no difference of Insurance between the direct and Sunderbund passage; the difference of freight may be estimated by the difference of time estimated at seven days.

6th. The reply to the preceding, furnishes an Answer to this Query.

7th. An answer to this Query has been partly furnished in the observations offered in reply to Query 3d. It is impossible to answer this Query with any expectation of approaching the truth; with respect to the Imports into Calcutta by the Hooghly, it is probable that at the least 7-8ths of the whole are from the Provinces West of Bogwangolah.—

**In regard to the Exports, the Board regret their inability to speak with any thing like the same confidence they have done of the Imports, since by far the largest proportion of the Goods Exported from Calcutta, pass into the interior free of duty, and their value is but imperfectly recorded in the Custom House Books;—they consist chiefly of Goods Imported by Sea, and are, for the most part, consigned to the Provinces West of Bogwangolah, whither they proceed viâ the Bogrutty.**

**8. The Trade from the Eastern Districts is for the most part composed of Timber, Chunam, Grain, Firewood, Charcoal, Mustard Seed, and other Gruff Articles of comparative trifling value—the Duty upon which is small; on the transit of such articles a heavy toll could not be levied. The Board regret they cannot form an Estimate of the value in Sicca Rupees of this branch of Trade They have before them a Statement which gives the following return of the Boats which Imported from the Eastern Districts in the years 1819, 1820, and 1821, from which they gather that the Imports, taking the average of the aforementioned three years, were as follows:—**

| | | |
|---|---|---|
| **At Tolleygunge Ghaut about** | **1,760** | **Boats.** |
| **At Gurreah Ghaut. .. ..** | **100** | **..** |
| **At Balleah Ghaut, .. ..** | **4,000** | |
| **Boats, .. ..** | **5,860** | |

**This is the only Document the Board have before them at present; it is not strictly speaking an Official one, and they would not wish it to be understood as placing any reliance on its correctness. As the Committee however are anxious to receive the Board's answers to the Queries proposed for their consideration, they send this imperfect statement rather than incur the delay of a further reference to the Inland Custom House. If however, the Committee should desire a more correct Return of the Eastern Trade than the Board are at present prepared to furnish, and will express their wish to that effect, the necessary steps shall be taken to procure it.**

**9. For the reason assigned in the reply to the preceding question, the Board are incapable of furnishing a very satisfactory answer to this, but they think they are not very far out when they state that of the Goods Imported to and Exported from Calcutta, viâ the Sunderbuns, 19 parts in 20 are from the Eastern Districts.**

**10. Is answered above.**

**BOARD OF CUSTOMS,**
**SALT AND OPIUM,**
***The* 8*th August*, 1822.**

***(Signed)*** **H. SARGENT,**
***Secretary.***

## E 66.

To H. SARGENT, ESQ.

*Secretary to the Board of Customs, &c*

SIR,

I have the honor to acknowledge the receipt of a Letter from you, under date the 8th instant, transmitting replies of the Board of Customs, to points on which their sentiments were requested, relative to Lieutenant Schalch's Plan, for improving the Navigation of the Sunderbuns, &c.

With reference to the Board's replies to 8th and 9th Queries, I am requested by the Committee to express their wish that the Board will oblige them by obtaining for them more detailed information with regard to the proportion of Inland Export and Import, which may be referred to the Provinces East of Calcutta by the River Hooghley and the Sunderbuns respectively, as the Committee are of opinion that the most accurate information that can be procured on those points, is essentially necessary to enable them to form an Estimate of the advantages likely to accrue, from the prosecution of the proposed Canals.

I have, &c.

CALCUTTA, (*Signed*) H. SHAKESPEAR,

*9th August*, 1822. *President Special Committee, Lieut Schalch's Plan.*

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## F

To H. SHAKESPEAR, ESQ.,
CAPTAIN. H. MORRIESON,
G. J. GORDON, ESQ.
AND
G. BALLARD, ESQ.

*Committee for Reporting on Lieutenant Schalch's Plan.*

Territorial Dept. Revenue,
20th March, 1823

GENTLEMEN,

I am directed by the Honorable the Governor General in Council to acknowledge the receipt of your Report, dated the 28th October last, together with the Book of Proceedings mentioned to accompany it, and to transmit to you, for your information, the accompanying Copy of a Resolution, this day passed by Government on the subject of it.

2. The Governor General in Council has desired me to convey to you his cordial thanks, for the valuable service which you have, with so much zeal and public spirit, rendered on the occasion; and to request that you will make the necessary communication to your Secretary, Captain Faithfull, on the subject of the 36th and 37th Paragraphs of the Resolution. That Officer will of course make over charge of all Proceedings, Maps, and other Documents, which he may have in his possession to the Committee appointed by the 27th Paragraph of the present Resolution, or to their Secretary Captain Jackson of the Quarter-Master General's Department.

I am, &c

*(Signed)* HOLT MACKENZIE,
*Secretary to the Government*

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# F 1.

Revenue,
The 20th March, 1823.

## *Read a Letter from the Committee for Reporting on the Plan of a Canal proposed by Lieutenant Schalch, for facilitating the Communication between the River Hooghly and the Eastern Districts of Bengal.*

RESOLUTION.—The Governor General in Council having deliberately considered the above Report, and the Papers which accompanied it, is fully satisfied of the expediency of undertaking the proposed Work without delay.

2. The practicability of making the Canal in question, at a charge not exceeding the amount estimated by the Committee, and the facility with which, when made, it may be kept open, appear to be fully established.

3. It seems to be very doubtful, whether any more direct line of communication between the River Hooghly and the Ganges can be rendered navigable throughout the Dry Season; and there is thence reason to conclude, that the work will afford a very important facility to the Trade of the Western Provinces.

4. Independently, however, of this branch of Commerce, the great utility of the projected Canal appears to be fully established.

5. The information procured by the Committee, in regard to the nature and value of the Articles brought to Calcutta from the Eastern Districts of Bengal, is much less full and satisfactory than might have been expected from the Officers who were consulted. That the Commerce is very extensive, is however certain. The number of Boats which,

pass through Tolly's Nullah,[a] and the Eastern Canal, the large amount of the collections [b] drawn from that source; the throng of Carriages on the road leading from Calcutta to the Salt Water Lake, are alone conclusive on the point. The bulky nature of the articles in which the Commerce consists; the low value which they bear at the places whence they are brought, contrasted with their prices in the Calcutta market, are all circumstances calculated to enhance the importance of a work, by which a considerable delay will be obviated, and the charges of freight proportionately reduced.

(a)

| | Number of Boats. | Burthen of Boats. |
|---|---|---|
| | | Maunds. |
| 1818-19 ...... | 22,817 | 46.60,223 |
| 1819-20 ...... | 20,646 | 58,30,107 |
| 1820-21 ...... | 18,099 | 65,65,912 |

(b)

| | Tolly's Nullah. | | New Canal | |
|---|---|---|---|---|
| | Gross Collections. | Net Collections | Gross Collections. | Net Collections. |
| 1818-19. | 89,596 | 81,891 | 17,191 | 15,027 |
| 1819-20. | 88,401 | 80,187 | 18,107 | 15,001 |
| 1820-21. | 78,495 | 68,874 | 17,606 | 15,384 |
| Average. | 85,497 | 76,984 | 17,661 | 15,137 |

6. Government had, not long ago,* occasion to notice the great enhancement which had occurred in the price of Firewood, of which article the chief part of the cost consists in the expense of Carriage. Of all other necessaries, the price has risen with the rising prosperity of Calcutta; and in proportion as population extends, and the sphere whence supplies are drawn is enlarged, it becomes of course important that the means of conveyance should be facilitated.

* Separate Consultation, 19th, March 1822 No

7. The collections which may be made in the Canal in question, will no doubt partly consist of Tolls, that would otherwise have been collected in Tolly's Nullah—but the insufficiency of that Channel has long been admitted: the delays and difficulties which occur in the passage through it, constitute a serious evil. It could be rendered adequate to the Trade which passes through it, only by an operation involving an heavy expense,—not only through the charges of the excavation, but in the purchase of much valuable property lying on its banks: and after all would only imperfectly provide for the objects in view.

8. It is impossible to contemplate its present condition, crowded as it is with Boats, and affording a long and inconvenient passage to the Soonderbuns, without a strong conviction that the Community have reason to complain of the appropriation of the Toll levied. For greatly as Government must benefit by every facility given to Trade, it is plain that such imposts ought to be regarded less as a source of direct profit, than as a fund to meet the charge of maintaining and extending the Channels of commercial intercourse. Viewing the matter in this light, the Governor General in Council would doubt the propriety of maintaining the existing Tolls, were it his intention not to adopt any arrangement for facilitating the approach to Calcutta: and in the stated receipts from Tolly's Nullah and the Eastern Canal, he recognises at once an assured ground of confidence, that the Work proposed by Lieutenant Schalch, will be extensively beneficial,—and that the expense of it may be met, without any pressure on the general resources of Government. All experience indeed tends to shew, that there is scarcely any application of Capital more profitable than that which is directed to the object of improving the natural advantages for internal Navigation, which the Delta of the Ganges presents; and that in sanctioning any work of this kind, the Question will generally be, not whether Government cannot secure an adequate return, but how far it ought to push the direct advantage, in consideration of the remoter, though not less certain benefits, of an improved Commercial intercourse.

9. On the above grounds, and with reference to the facts and observations stated at large in the Report and Proceedings of the Committee, the Governor General in Council, being fully persuaded that the Work proposed by Lieutenant Schalch, with the Modifications suggested by the Committee, will be very beneficial to the Community; that it will afford essential facilities to the Internal Commerce of the Country; and that there is every prospect of its ultimately yielding an ample return for the capital to be expended, does not hesitate to Resolve—That the undertaking shall immediately be commenced.

10. Of the several Suggestions submitted by the Committee, in modification of Lieutenant Schalch's original Plan, it is sufficient to express generally the approval of Government

11. The expense of the work, executed as proposed by them, will amount, according to the Estimate exhibited in the 58th paragraph of their Report, to Rupees 9,27,350; or including the charges of Superintendence to about 10½ lacs of Rupees.

12. This appears to be the utmost expense that is at all likely to be incurred. At the present rate of interest (5 per cent) a net receipt of 52,500 Rupees per annum will bear Government harmless, and there appears not to exist the slightest ground of doubt, that a much more favorable result will be realized.

13. With respect to the purchase of Ground adjoining to the line of the Canal, which has been recommended both by Lieutenant Schalch and by the Committee, as a means of lightening the charge of the undertaking, the Governor General in Council observes, that the prospect of a profit, to the extent contemplated by the Committee, would appear to be certain; and in so far as the Ground can be purchased with the consent of the parties, he is not aware of any objection to the measure proposed by them. Undertaking a work by which the value of a certain tract will be greatly increased, Government, like an individual similarly circumstanced, is of course fully at liberty to speculate on the consequences of its own operations. The case however is very different, when it becomes necessary to compel individuals to surrender their property against their inclination. The compulsion is justified only by the necessity of the case; and by the right of all Governments to require that individual interests, or affections, should yield where they stand in the way of objects of great public utility. But then the application of the principle must be restricted to cases clearly falling within its scope; and the rule could not assuredly be brought to justify the ejectment of an individual from property, which Government desired only to obtain with a view to profit on the resale.

14. As far as may be necessary for the Canal, for commodious Roads on each side of it, and for the means of convenient access to it from the City, Government will be fully prepared to compel the surrender of the Land required, and the necessary Legislative Enactment, which has long been under preparation, and delayed only that it might be combined with other objects, requiring further investigation, will be passed at an early period.

15. In the meantime, however, the Collector of the 24-Purgunnahs will be instructed to give effect to such directions as he may receive from the Committee of Superintendence, hereinafter mentioned, relative to the purchase, by private contract, of such lands as may be procurable on favorable terms, in the line of the Canal.

16. The other Collectors, through whose Districts the course of the Canal may run, will likewise be instructed to afford every aid and information to the Superintendent

of the Canal and his Assistant, and to be guided in regard to the purchase of land by any instructions they may receive from the Committee.

17. For the immediate direction and personal superintendence of all the works connected with the Canal, the Governor General in Council cannot hesitate to select Lieutenant Schalch, the Author of the Scheme, to whom Government is greatly indebted for his gratuitous exertions on the occasion; and by whose science and zeal the ultimate success of the undertaking must be essentially promoted.

18. Lieutenant Schalch may, at the same time, the Governor General in Council conceives, be very beneficially employed in the exercise of a general superintendence of all similar works in the vicinity. The construction of the Canal, encircling the North-east portion of the City, involves the necessity of erecting several Bridges across it. These the Governor General in Council entirely concurs with the Committee in thinking, should be of iron, and constructed on the Suspension principle; similar Bridges have been already suggested for the Western Military Road, and for the Cuttack Road; and others will doubtless be required in other quarters. Lieutenant Schalch appears to be peculiarly well qualified for Superintending the construction of such Bridges; the iron work of which will, the Governor General in Council presumes, be generally prepared at the Presidency; and this duty may apparently be expediently united with that above proposed to be entrusted to Lieutenant Schalch.

19. The Governor General in Council accordingly resolves,—that Lieutenant Schalch be appointed Superintendent of Canals in Bengal, and Agent for the preparation of Suspension Bridges.

20. In this capacity he will execute the several duties connected with the Canal in question, which are pointed out in the Committee's Report; and such others relating to the Departments as may hereafter be prescribed. The duties will involve great labor and responsibility, with much exposure to the climate. The allowances of the Office should therefore be fixed on a liberal scale; and the Governor General in Council therefore resolves that Lieutenant Schalch shall receive Sa. Rs. 1,000, per mensem in addition to his military pay and allowances, with such allowance for boats and other incidental expenses, as shall hereafter be determined, on reference to the Committee of Control, under which he is to act.

21. When the Work is completed, and its success practically demonstrated, the Governor General in Council will be prepared to consider whether any, and what further remuneration shall be assigned to Lieutenant Schalch, as the originator of the Scheme, either in the form of a per centage on the net Collections, or in any other shape.

22. Adverting to the length of time which the Work, now about to be undertaken will require for its completion, and anticipating the expediency of maintaining permanently the office of Superintendent for the repairs which that and other similar works must annually require, it appears to the Governor General in Council to be proper to remove Lieutenant Schalch from the Quarter-Master-General's Department—with the reserve that, should the present arrangement fail to obtain the sanction of the Honorable the Court of Directors, he shall be entitled to re-enter that Department, without prejudice to his rank.

23. To aid Lieutenant Schalch in the execution of the above duty, the Governor General in Council further resolves, that an Officer shall be appointed his Assistant, on a Salary of Rupees 500 per mensem; his immediate duty will be that indicated in the

66th and 67th paragraphs of the Committee's Report; but he will also execute whatever directions he may receive from Lieutenant Schalch, relative to the construction of the Canal, or the Survey of the tract through which it is to be led.

24. As to the subordinate establishment of Overseers, &c. it is sufficient to state that the Governor General in Council considers the suggestions of the Committee to be generally judicious; and he will be prepared, at the proper time, to sanction the several establishments proposed, with any modifications which Lieutenant Schalch and the Committee of Control may recommend.

25. The first steps are, the careful Survey and demarcation of the line of the Canal; and the purchase of the necessary ground. The establishments necessary to be entertained by Lieutenant Schalch and his Assistant, while engaged in the preparatory Survey, will be hereafter sanctioned, according as they may from time to time be submitted and approved by Government.

26. All preparatory arrangements, as well as all the works to be hereafter executed, will be undertaken by Lieutenant Schalch under the control of a Committee to be constituted in the manner, for the purposes, and under the rules, suggested in the 76th and five following paragraphs of the Report.

27. This Committee, the Governor General in Council resolves, shall consist of the Officers named in the *margin, with whom also the Magistrates of the several Districts in which the course of the Canal lies, shall be associated, in the consideration of all questions depending on matters of local detail, in so far as it may be found useful to require their co-operation.

*Mr. Paton, 2d. Member of the Board of Revenue.
H. Shakespear, Superintendent of Police.
C. Barwell, Judge and Magistrate, Suburbs of Calcutta.
Captain Swinton, Superintendent Public Buildings, Lower Provinces.

28. Captain Jackson, of the Quarter-Master-General's Department, will act as Secretary to the controlling Committee; and will receive in this capacity a salary of Rupees 200 per mensem.

29. The Committee will Report what establishment of Writers or Native servants may from time to time be required for their Secretary's Office: observing all practicable economy consistently with the dispatch of business, and the careful and early examination of all Estimates or Accounts submitted to them.

30. As to the particulars of the work, or the detailed conduct of the duties, which will belong to the controlling Committee, to Lieutenant Schalch, his Assistant, and Subordinate Officers, no immediate orders or observations from Government appear to be necessary.

31. When the excavation of the Canal, or the construction of any of the subsidiary works is about to begin, the Committee will of course apply to Government for the necessary advances, which will be made under the general rules applicable to Disbursements on account of Public Works, modified as the circumstances of the case may render necessary,—so also during the prosecution of the work, the necessary advances will be authorized on application of the Committee, from whom the Governor General in Council will expect to receive periodical Reports of its progress.

32. The Committee will meet at their early convenience, and arrange together the form and mode of their Proceedings. Lieutenant Schalch will be guided by the instructions he may receive from them.

33. The suggestion contained in the 18th Para. of the Committee's Report relative to the construction of a Tunnel, as proposed by the late Mr. Blechynden, will be referred

for Report to the Magistrates of the Conservancy Department, who will obtain and submit to Government a detailed Estimate of the probable expense of the work, with their opinion as to its utility.

34. It remains only for the Governor General in Council to express the sense he entertains of the valuable service which the Special Committee have with so much zeal and public spirit rendered on the occasion. The inquiries instituted by them, appear to have embraced every point that could bear upon the subject. If the information furnished in reply has proved in some respects deficient, the result in no way detracts from the merits of the Committee, whose investigations and Report have afforded the most essential aid to Government in forming a judgment on the important and intricate subject submitted to them.

35. The Committee therefore are fully entitled to the cordial thanks of the Governor General in Council, which will accordingly be conveyed to them.

36. The Governor General in Council fully concurs with the Committee in the Estimate which they have formed of the laborious nature of the duties which devolved on their Secretary, Captain Faithfull, and of the zeal and ability with which that Officer has executed them. He is pleased therefore to assign to that Officer the sum of Sa. Rs. 5,000 in remuneration for the services performed by him, and the Sub-Treasurer will be accordingly instructed to pay the amount to Captain Faithfull's order.

37. Had Captain Faithfull held any appointment at the Presidency, the Governor General in Council would have been happy to accede to the recommendation contained in the 92d paragraph of the Committee's Report. But at present the extent of the duties that will devolve on the controlling Committee and their Secretary, would not seem to be such as would justify Government in assigning to the latter Office, the exclusive services of an Officer of Captain Faithfull's rank

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# G

To HOLT MACKENZIE, ESQ.,

*Secretary to Government in the Territorial Department*

Cons. 23d April, 1823, No 8.

SIR,

We have the honor to transmit our Supplementary Proceedings on the Sunderbund's Canals, which contain information collected since closing the Report dated the 28th October last. Adverting to the details recorded on these Proceedings, to our investigations on a line of Canals proposed to be established between Calcutta and Saugor Island ; and to the recent fluctuations in the Indian Funds, we submit for the consideration of the Honorable the Governor General in Council, the following observations in continuation of our Report on the Sunderbund's Canals.

2. In the 19th, 23rd, and 45th paragraphs of our Report, particular advertence was made to the state of the Navigation through Tolly's Nulla ; the subject is again introduced ;

3 m

but, in more forcible language, in quotations made from correspondence in the 33rd Paragraph of our Report on the Saugor Canals, dated the 17th ultimo. These several statements render it apparent, that the channel of Tolly's Nulla, however appropriated, must be improved to render its navigation free; supposing this indispensable requisite were accomplished, still this passage would continue, generally, ill adapted for the Import and Export Trade of the City of Calcutta, particularly so in regard to all articles destined for consumption of the Inhabitants of the City, such as Grain, Salt, Firewood, and other Gruff goods. A very cursory glance at the course of this Nulla, and the site of Calcutta, could not fail to establish the conclusion we have drawn.

3. Impressed with a conviction of the inadequacy and unfitness of Tolly's Nulla for the transit of the extensive Trade to which it is now necessarily applied, we have strongly recommended the formation of a Canal across the Salt Water Lake, and round the Circular Road, to the River Hooghly at Chitpore

4. Should Government be induced to adopt the Embouchure suggested by Lieutenant Schalch, and concurred in by us, for the Line of Canal between Calcutta and Saugor Island, the opening of a new channel of communication between the City of Calcutta and the Eastern Provinces through the Sunderbuns, cannot, we conceive, be postponed. The adoption of this measure, with an improved construction of Bridges at Allypoor and Kidderpore, and the cleaning and widening the bed of Tolly's Nulla at the narrowest places, would render this passage equal to the free transit of the Trade by the projected Saugor Canals, and for such portions of the Eastern Provinces and Sundurbuns Trade as may be destined for the consumption of the South-Eastern Suburbs of Calcutta, with the Towns of Bowannipoor, Allypoor, and Kidderpoor, the parts of the City which border the Hooghly River, and its opposite shore, Howrah. The consumption of Grain, Firewood, and other Gruff articles, at those places, must occupy a considerable portion of the Tonnage which now pays Toll at Tolly's Nulla; the amount of these collections would remain unimpaired, although a new passage should be opened to communicate with other quarters of the City and its Suburbs.

5. The intercourse with the Western Provinces by the direct routes to the Ganges, has again, we understand, been interrupted at a very early period in the present season. Store Boats which were dispatched from the Presidency by the direct route, before the middle of February had been compelled to return and take the circuitous route of the Sunderbuns. We mention this circumstance, because the general apprehension, expressed by us, of the practicability of the passage by the Bhagrutty and other Channels to the River Ganges, during the Dry Season, were opposed to the opinion of some of our correspondents, whose communications were recorded on our Proceedings.

6. On the amount of Tolls leviable, we have already expressed our regret [paragraph 39th, Report 28th October,] that the statements exhibiting the Inland Trade of Calcutta were too imperfect to warrant a tolerably correct Estimate. The Proceedings now forwarded, add somewhat to the information previously obtained. It is still, however, inadequate to the purpose required. From Statements given in by Mr. C. Trower, Collector of the 24 Pergunnahs, Tolls levied on Boats, &c., passing through Tolly's Nulla, and to the Balleakhal Canal, during the years 1820, 1821, and 1822, amounted to Sa. Rs. 2,99,370, or an average per annum, Sa. Rs, 99.790. That the facilities and advantages the new route must afford to the Western and North-Western Trade in addition to that of the Eastern Provinces, would attract an equal quantity of Craft, we cannot doubt.

7. The Tolls on the whole Line of Canals from Koolna to the River Hooghly at Chitpoor, may properly be rated higher than the scale now established for Tolly's Nulla.

Taking, therefore, into consideration the advantages and savings to the Trade in its transit by the new route, the Tolls might we conceive be augmented in proportion to the reduction of expense by this route; five days may be taken as a low Estimate of time saved; the reduction of freight, would, on this Estimate, taking the amount of the Trade in Mr Trower's Statements (pages 14 and 15 Supplementary Proceedings) produce a sum exceeding one Lac of Rupees.

8. The sum named is indeed produced by a very rough mode of calculation, but apparently a fair one--viz An annual Collection of toll has been realized, amounting to Sicca Rupees 91,934 on 45,599 Boats of various sizes and descriptions. Estimating the average hire per diem of each of these Boats at only* eight annas, five days hire on the number quoted, would produce Sicca Rupees 1,13,897 per annum.

* The hire of a 300 md Boat, is Rs. 0-15-$\frac{4}{5}$ per diem

It does not appear to us that an augmentation of Tolls on this principle would increase the actual expense incurred in the transit of Merchandize—although it would more than double the amount of Tolls collected for the accommodation afforded by Tolly's Nulla, and the Balleeakhal Canal.

9 The increased rates of Toll would necessarily have to be distributed along the whole Line of the new Canals, and with reference to their extent and the existing regulations of Government [Reg. XVIII, A. D. 1806, VII, A. D. 1810 and IV, A. D. 1813] regarding Tolls this might be proportioned as follows—viz.

*First.*—From the River Hooghly at Chitpoor to Tardah, [distance about 21 miles] and vice versâ, an addition of about† one-third to the present charges for Toll levied on each class of Boat or Cargo passing through Tolly's Nulla [distance about 18 miles.],

| | | | |
|---|---|---|---|
| † Present Rates per 0-0 maunds. | Sa. Rs. 2. 0:0 | 1 0:0 | 0. 4·0 |
| Additional rate. .. .. | 0:12:0 | 0·6:0 | 0:2:0 |
| Proposed rate. | Sa Rs. 2:12:0 | 1 6.0 | 0 6·0 |

*Secondly.*—From Tardah, on the Beedadoory River, to Hoossainabad on the Juboonah River, and vice versâ, [distance about 30 miles] ‡ One-third of the rate of Toll collected on Tolly's Nulla.

‡ Rate proposed per 0-0 maund } Sa. Rs. 0. 10 0 | 0:5:0 | 0. 2·0

*Thirdly.*—From Hoossainabad to Taikah on the Cobbaduck River, or vice versâ, [distance about 20 miles]§ One-sixth of the rate of Toll collected on Tolly's Nulla.

§ Rate proposed per 0-0 maund } Sa. Rs. 0:5 0 | 0 3·0 | 0. 1:0

*Fourthly.*—From Taikah to Hutbharee on the Boirub River below Koolna, or vice versâ, [distance about 25 miles] || One-sixth of the Rate of Toll collected on Tolly's Nulla.

|| Rate proposed per 0-0 maund } Sa. Rs. 0:5:0 | 0:3:0 | 0·1:0

10. The rates in money entered in the Margin, do not exactly correspond with the quotas of one-third, or one-sixth, as briefly stated in the text; because it appeared advisable to avoid fractions of annas, where this could be done without raising the scale above the estimated reduction of freight, by the five days diminution in the length of passage.

11. We are sensible that in practice it may be found convenient, if not indispensably necessary, to reduce the Stations at which Tolls should be collected. A reference to the Map of the Sunderbunds will shew, that the Stations here selected are on those principal Rivers, and at points where portions of the Eastern and South-Eastern Trade may be expected to fall into one or other of the Lines of Canals; and it would be obviously improper to make such an arrangement of Tolls as should Tax the Trade, availing itself of a part

of the accommodation the Canals afford, equally with that which might have to traverse along their whole course.

12. We have only now briefly to notice the last subject, which combined with those already adverted to, have induced us to lay before the Honorable the Governor General in Council this Supplementary Report on the Sunderbunds Canals. In all the Calculations and Estimates included in our Report of the 28th of October, it was incumbent on us to shew, in support of our recommendation of so great an undertaking, that it was calculated to yield, either to the Trade of the Country, or to the Revenue of the State, a return equal to the Government rate of Interest, on the money to be expended. This Interest was then six per cent ; but it is reduced by the late financial notification to five per cent., or one per cent in favour of the outlay on the projected Canals. It will be seen in Para. 62 of our Report, that the collections on Boats making use of the Harbour, in the Circular Road Canal, was Estimated at Sa. Rs. 50,000 per annum. an income at the present established rate of interest on Government Loans, sufficient to repay an outlay of Ten Lacs of Rupees, —the Estimated cost of the entire Line of Canals between Chitpoor on the River Hooghly, and Hatbharee on the Boirub River.

We have the honor to be,
Sir,
Your most obedient Servants.
H. SHAKESPEAR
G. BALLARD.

CALCUTTA,
*The 31st March*, 1823

# G 1.

## AT A MEETING HELD AT THE HOUSE OF H. SHAKESPEAR, ESQ

| | | |
|---|---|---|
| *Absent*, | | W. B. BAYLEY, ESQ. *President*. |
| *Present*, | *Members*. | H. SHAKESPEAR, ESQ. |
| *Absent*. | | CAPTAIN H MORRIESON. |
| *Absent*, | | G. J. GORDON, ESQ. |
| *Present*, | | G. BALLARD, ESQ. |

***Read and approved the Supplementary Proceedings since the Meeting of the 28th, October last.—viz.***

1822.
*Nov. 1st*, The Secretary on this date paid up and discharged his Office establishment, agreeably to the Resolution, to that effect, passed at the last Meeting.

Ditto. The Report to Government on the Sunderbuns Canals, dated the 28th ultimo, was numbered 167, and dispatched on this date.

Ditto. The following Letters were addressed to the Secretary to the Lottery Committee and Surveyor General.

# G 1. *a.*

No. 168.

1822. To THE SECRETARY TO THE LOTTERY COMMITTEE,
*Nov. 1st.* *Calcutta.*

SIR,

I have the honor, by direction of the Committee for reporting on Lieutenant Schalch's Plans, to return herewith the Book of Calcutta Levels alluded to in the 14th paragraph of your Letter to my address, under date the 27th May last.

I have, &c.

FORT WILLIAM, (*Signed*) R. C. FAITHFULL, *Captain*,
*The 1st Nov.* 1822. *Secy. Special Committee, Lieut. Schalch's Plans.*

# G 1. *b.*

No. 169.

To CAPTAIN HODGSON,
*Surveyor General.*

SIR,

I have now the pleasure to return the Maps, &c. obtained from your Office. The large tin case contains the Eight Documents, entered in the accompanying Copy of my Receipt dated the 3rd October, 1821. The Levels in my Receipt of the 31st of January last, are in the small case with two other Documents, for which I cannot discover that I gave a Receipt.

Have the goodness, if the Maps are all right, to return my original Receipts, and should there happen to be any other Paper belonging to your Office in my possession, let me know, that I may seek for and return it.

I have, &c.

FORT WILLIAM, (*Signed*) R. C. FAITHFULL,
*The 1st. Nov.* 1822. *Secy. Special Committee Lieut. Schalch's Plans.*

# G 2.

## *The following Receipts granted by the Secretary to the Surveyor General for Maps, &c. were returned and Cancelled.*

CATALOGUE OF MAPS.

No. 1. A Plan of the Calcutta River.

Survey of Choornee, and part of the Issamuty Rivers.

Ditto, through Tolly's Canal, and a part of the Sunderbuns and the Ju[illegible]oonah River.

Ditto, of Choornee, or Hurdum River.

1822. Survey of Cossimbazar River, with part of the Jellinghy.

*Nov. 1st.* Ditto, of Salt Chokies.

Ditto, of the Issamuty and Juboonah Rivers.

Ditto, from Bhovanipoor to Chouragundpoor.

Ditto, of the Ganges from the Head of the Jellinghy to Sautpoor Rivers, No. 25.

*(Signed)* R. C. FAITHFULL,
*Secretary Special Committee.*

*3rd October*, 1821.

## *Received from the Office of the Surveyor General of India.*

No. 2. Table of Levels carried from the bank of the Hooghly River in different parts of the Town of Calcutta towards the Mahratta Ditch and Salt Water Lake, marked 3rd Class 2nd Division, No. 25.

CALCUTTA,
*31st January* 1822.

*(Signed)* R. C. FAITHFULL,
*Secretary Special Committee*

## 3 3.

## *The following Letter with enclosures, was received from the Secretary to the Board of Customs, Salt, and Opium.*

*Nov. 15th.* To H. SHAKESPEARE, ESQ.

No. 3. *President of the Committee on Lieutenant Schalch's Plans, of improving the Navigation of the Sunderbuns.*

SIR,

Copy of a Letter dated the 9th instant from Collector of Inland Customs, with Copies of two Statements referred to therein.

I am directed to acknowledge the receipt of your Letter dated the 9th of August last, and in reply to transmit to you the Papers noted in the Margin, containing such additional particulars in respect to the points noticed by the Committee, as the Board have been able to collect.

2. The Collector of Inland Customs is employed, as you will perceive, in compiling some further Statements for the use of the Committee, which will enable them, it may be hoped, to arrive at some satisfactory result in considering Lieutenant Schalch's Plan for improving the Navigation of the Sunderbuns.

I have, &c.
*(Signed)* H. SARGENT,
*Secretary.*

BOARD OF CUSTOMS,
SALT, AND OPIUM,
*The 13th November*, 1822.

# G 3. a.

1822.
*Nov. 15th.*
No. 4.

To J. SWINTON,
J. P. LARKINS,
AND
THE HONORABLE C. R. LINDSAY,
*Members of the Board of Customs.*

GENTLEMEN,

In answer to your Board's Orders under date the 10th of August, calling for the Report of the number of Boats and value of the Import and Export Trade to and from the Eastern Provinces, by the River Hooghly and the Sunderbunds, respectively, during the years of 1819-20 and 21, I have the honor to state, that being debarred by the 7th paragraph of the Orders of Government, under date the 25th of July, from entertaining any extra Establishment, I have been obliged to use as opportunity offered, the Officers of my Establishment.

2. In respect to the Export Trade, the information cannot be supplied without a very great expense and labour, and the time required would render it useless, as the only means of arriving at the true Statement, is by examining the Export Registers for the Nos. of the Rowannahs, and value of the Goods—which must again be searched for in the several Ghaut Registers.

3. Such of the information as has already been prepared, which consists of a Statement of the quantity of Imports by Ghurriah and Balliaghaut for the three years required, and the value of those Goods which came by Ghurriah for the years 1819-20, I beg leave to forward—the remainder of the Imports shall be transmitted as soon as they are finished.

I have, &c.
*(Signed)* H. J. CHIPPINDALL,
C. J. C.

CALCUTTA INLAND CUSTOM HOUSE.
*The 9th November*, 1822.

(A True Copy,)
*(Signed)* H. SARGENT,
*Secretary.*

BOARD OF CUSTOMS,
SALT, AND OPIUM.

1822.
*Nov. 15th.*
No. 5.

# G 3. a.(1)



***Statement shewing the Quantity and value of the Goods which came from the Eastern Provinces by the Sunderbuns at Gurreah Ghaut during the years 1819 and 1820 inclusive.***

| *Date.* | *Sugar.* | Value. | *Jagree.* | Value. | *Suker.* | Value. | *Khaur.* | Value. | *Mustard Seed.* | Value. | *Oil.* | Value. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mds. Sr. Cht. | Rs. As. P. | Mds. Sr. Cht. | Rs. As. P. | Mds. Sr. Cht. | Rs. As. P. | Mds. Sr. Cht. | Rs. As. P. | Mds. Sr. Cht. | Rs. As. P. | Mds. Sr. Cht. | Rs. As. P. |
| 1819, | 6,612 4 0 | 41,711 0 0 | 43,783 23 0 | 73,628 13 3 | 341 0 0 | 1,273 6 0 | 6,753 25 0 | 29,606 4 6 | 82,187 39 0 | 1,59,687 6 9 | 8,441 5 0 | 57,232 6 3 |
| 1820, | 2,103 20 0 | 17,216 8 0 | 23,161 18 0 | 47,884 11 0 | .... | .... | 247 30 0 | 1,156 0 0 | 52,647 13 0 | 92,247 13 6 | 2,779 5 0 | 20,004 14 0 |
| Total, | 8,715 24 0 | 58,927 8 0 | *66,945 11 0 | 1,21,513 8 3 | 341 0 0 | 1,273 6 0 | 7,001 15 0 | 30,762 4 6 | 1,34,835 12 0 | †2,51,933 4 3 | 11,220 10 0 | ‡77,937 4 3 |
| | *Wood Oil.* | Value. | *Indigo.* | Value. | *Chunam.* | Value. | *Beetel Nut.* | Value. | *Dhunea Seed.* | Value. | *Jowr Seed.* | Value. |
| | Mds. Sr. Cht. | Rs. As. P. | Mds. Sr. Cht. | Rs. As. P. | Mds. Sr. Cht. | Rs. As. P. | Mds. Sr. Cht. | Rs. As. P. | Mds. Sr. Cht. | Rs. As. P. | Mds. Sr. Cht. | Rs. As. P. |
| | 741 11 0 | 2,098 13 3 | 2,447 36 1¼ | 2,44,790 8 9 | 2,42,992 4 0 | 69,287 7 7½ | 33,2[illegible]9 4 0 | 1,57,607 2 0 | 3,992 39 0 | 7,465 10 0 | 30 0 0 | 106 8 0 |
| | 460 0 0 | 1,443 11 0 | 3,783 3 14 | 4,18,337 5 6 | 2,29,908 20 0 | 59,9[illegible]1 11 0 | 32,495 20 0 | 1,33,057 10 0 | 5,188 8 4 | 10,554 5 9 | 45 0 0 | 100 0 0 |
| | 1,201 11 0 | 3,542 8 3 | 6,230 39 15¼ | 6,63,127 14 3 | 4,72,900 24 0 | 1,29,189 2 7½ | 65,754 24 0 | 2,9[illegible],664 12 0 | 9,181 7 4 | 18,019 15 9 | 75 0 0 | 206 8 0 |
| | *Sweet Leaf.* | Value. | *Anise Seed.* | Value. | *Sapan Wood* | Value. | *Planks.* | Value. | *Long Pepper.* | Value | *Long Pepper Root.* | Value. |
| | Mds. Sr. Cht. | Rs. As. P. | Mds. Sr. Cht. | Rs. As. P. | Mds. Sr. Cht | Rs. As. P. | Pieces | Rs. As. P. | Mds. Sr. Cht. | Rs. As P. | Mds. Sr. Cht. | Rs. As. P. |
| | 888 0 0 | 1,240 12 0 | 580 0 0 | 2,389 14 0 | 4,560 0 0 | 6,552 2 0 | 1,830 | 1,857 6 9 | 175 0 0 | 3,119 11 3 | 244 30 0 | 1,800 0 0 |
| | 68 0 0 | 171 12 0 | .... | .... | 4,852 28 0 | 6,198 4 6 | 6,037 | 2,520 0 0 | 185 5 0 | 2,776 14 0 | 296 10 0 | 1,983 9 0 |
| | 956 0 0 | 1,412 8 0 | 580 0 0 | 2,389 14 0 | 9,412 28 0 | 12,750 6 6 | [illegible],867 ps. | 4,377 6 9 | 360 5 0 | 5,896 9 3 | 541 0 0 | 3,783 8 0 |
| | | | *Qy. 66,945 11 0 | | | | | | | †Qy. 2,51,[illegible] 4 3 | | ‡Qy. 77,237 4 3 |

J. M.

## G 3. a.(2) —(continued.)

*Statement shewing the Number of Boats from the Eastern Provinces by the way of the Sunderbuns during the years 1819, 1820, and 1821 inclusive.*

1822.
*Nov. 15th.*

| Coir. | Dry Ginger. | Wax and Wax Candles. | Elephants' Teeth. | Tobacco. | Long Pepper Root. | Long Pepper. |
|---|---|---|---|---|---|---|
| Mds. Sr. Cht. | Mds. Sr. Cht. | Mds. Sr. Cht. | Mds. Sr. Cht. | Mds. Sr. Cht. | Mds. Sr. Cht. | Mds. Sr. Cht. |
| 289 5 0 | 1,724 5 0 | 103 34 8 | 1 15 0<br>11 Pieces. | 9.348 0 0 | 420 20 0 | ... |
| 24 0 0 | 517 0 0 | 62 0 0 | .. | 3,283 10 0<br>1,694 35 0<br>1,024 Bags. | 225 30 0<br>161 Bags,<br>261 0 0 | ... |
| ... | 105 0 0 | 233 18 8 | | | | 232 0 0 |
| 313 5 0 | 2,346 5 0 | 399 13 0 | 1 15 0<br>and 11 Pieces. | 14,326 5 0<br>and 1,024 Bags. | 907 10 0<br>and 161 Bags, | 232 0 0 |
| *Safflower.* | *Black Seed.* | *Guney Bags.* | *Manjeet.* | *Metty Seed.* | *Charcoal.* | *Noycha, or Snake.* |
| Mds. Sr. Cht. | Mds. Sr. Cht. | | Mds. Sr. Cht. | Mds. Sr. Cht. | Mds Sr. Cht. | |
| 121 20 0 | 320 0 0 | 5,669 | 99 20 0 | 88 0 0 | .. .. .. | .... |
| 149 0 0 | 97 20 0 | .... | .... | 271 0 0 | 946 0 0 | 9 |
| 155 0 0 | 330 31 0 | 12,000 | ... | .... | 3,053 10 0 | .... |
| 425 20 0 | 748 11 0 | * 17,659 | 99 20 0 | 359 0 0 | 3,999 10 0 | 9 |

* Qy. 17,669—J. M.

## G 3. a. (2)—(Continued.)

1822
*Nov 30th.*

| Stone Sills | Cammin Seed | | | Fish Oil | | | Hurritoll | | | Soap. | | | Cocoanut | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mds | Sr | Cht | Mds | Sr | Cht | Mds | Sr | Cht | Mds | Sr | Cht | | |
| .. | .. | | | .. | | | | | | | | | | |
| 50 | 10 | 10 | 0 | 516 | 30 | 0 | 23 | 37 | 1 | 157 | 20 | 0 | 475 | |
| .. | .. | | | 557 | 10 | 0 | . | | | 275 | 0 | 0 | | |
| 50 | 10 | 10 | 0 | 1,104 | 0 | 0 | 23 | 37 | 1 | 13[illegible] | 20 | 0 | 175 | |

*Grand Total*

| Number of Boats for 1819, 1820 & 1821 | Quantity of Maunds | Number of | | | | | |
|---|---|---|---|---|---|---|---|
| | | Pieces | Chests | Bags | Bales | Motes | Pairs |
| 5,136 | 15,63,180-38 12 | 36,670 | 1,231 | 73,815 | 3,011 | 330 | 9[illegible] |

CALCUTTA, (*Signed*) H J CHIPPINDALL
INLAND CUSTOM HOUSE, *Collector of Inland Customs*
*The 9th November*, 1822

(A true Copy.) (*Signed*)
BOARD OF CUSTOMS, SALT AND OPIUM, H SARGENT,

*The 13th November*, 1822 *Secretary*

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## G 4.

***The following Letter and Enclosure was received from the Acting Salt Agent of the Eastern Division of the 24-Purgunnahs.***

No 7 To CAPTAIN R C. FAITHFULL,

*Secretary to the Special Committee Lieut Schalch's Plans, Fort William*

SIR,

I have the honor herewith to submit my replies to the enclosure which accompanied your Letters under dates the 17th December 1821, and 14th of January last.

2. I have to apologise for the delay which has occurred in the transmission of these Papers, which has originated in my waiting for accurate information on some points connected with the subject, which has been greatly delayed, and the result of which is not after all so satisfactory as I could have wished.

I am, Sir, &c. &c

BARRIPORE SALT OFFICE, (*Signed*) R. C. PLOWDEN.
*The 20th November*, 1822

# G 4. *a.*

## List No. 3.

1822.
*Nov. 30th.*
No. 8.

## *On the Navigation through the Sunderbunds—Obstacles, Advantages. &c. &c.*

1. As far as in my knowledge of the part of the country through which the proposed Canals are to run, I conceive the Scheme practicable—no objections occur to me, as likely to oppose its accomplishment.

2. As Goodlad's Creek and Morrieson's Cut are under the District of Jessore, and I have never seen them, the Salt Agent, Collector, and Judge of Jessore may be able to answer this question more fully than I can do·as far as my knowledge goes, the depositions of mud and sand do not tend to fill up the navigable channels in the Sunderbuns; with regard to Goodlad's Creek, I am credibly informed that it has undergone no alterations since its excavation, excepting that it is a little broader than it was.

3. My experience does not enable me to reply with accuracy in answer to this question. The permanency of the banks does not appear to be much affected by the ebb and flood of the tides, they appear more favorable to their duration than the regular flow of water in one direction in Rivers without the influence of tides.

4. The proposed Line of Canal will certainly, in my opinion, tend to increase the cultivation of such Jungly tracts as are near, or intersect their line of route, provided the flow of Salt Water is excluded.

5. I believe the value of land in general between the two places, named and on or near the proposed line, is not exceeding one Rupee per cottah. The Judge and Collector of 24-Pergunnahs and Jessore can give more accurate information than I can do on this subject.

6. Very little or none. It is very difficult to procure coolies in this part of the 24-Pergunnahs, even for ordinary purposes.

7. The common price of tank-digging in the 24-Pergunnahs is as follows:—in digging the surface, or first cut, 8 chowkahs per Rupee; the dimension of a chowkah is 5 cubits long and 5 cubits broad, and 1¾ cubits in depth; in the second cut below the surface, 7 chowkahs of the above dimension per Rupee; in the third cut below the 2d, six chowkahs per Rupee.

8. My experience does not qualify me to answer with correctness to this Query; the Natives pay little or no attention to this subject; tanks are seldom dug in this District deeper than 18 to 20 feet,—and I have understood that in a greater depth than this, the water has the reputation of becoming brackish. As far as my experience goes, I have found that at the depth of 15 or 16 we have almost always come to a bed of sand.

9. I cannot by any means state with accuracy what number of boats are lost between Tardah and Koolna, no information being obtainable on this point; some are no doubt lost, and I conceive that the project of Lieutenant Schalch will tend to remove the dangers which are experienced in the Sunderbund Navigation; my Salt Agency in an Easterly direction does

1822. not extend beyond the Roymungul River, as laid down in the Map which
*Nov. 30th.* accompanied the Committee's Letter.

10. 1st. My knowledge and experience does not enable me to reply to this point.

10. 2nd. Losses by robberry and depredation between Nulleeah and Mooktarpore have come to my knowledge, but I cannot answer this Query with the accuracy required.

11. All small boats of less than 200 Maunds burthen, take 5 days from June to January of the year, and 6 or 7 days from February to May; boats above 200 Maunds burthen take 7 or 8 days from June to January, and 9 or 10 days from February to May, in traversing this passage, and *vice versa*.

12. Detentions are generally experienced in the route from February to June of the year, on account of the violence of the winds I cannot speak as to the points, or to the longest period of detention.

13. None other that I am aware of—except those pointed out in Lieut Schalch's own Memoir.

14. The adoption of Lieutenant Schalch's route, I think, would remove the aversion of the Native boatmen to the Sunderbund Navigation; because, the dangers which are to be incurred in the Sunderbund Rivers will not happen in the proposed route; the fear of tygers will be removed, and Hindoo Natives who now sometimes remain three or four days without the ability to cook their victuals on shore, will have this difficulty removed.

15. With respect to Goodlad's Creek, its length was originally about 1,300 cubits, its breadth just wide enough to admit a large pinnace to pass; the expense incurred in excavating Goodlad's Creek I understand, was 1,500 Rupees.

16. I am not.

17. I have never heard that any annual sum has been expended in keeping these Cuts in order.

18. This information might, I conceive, be readily procured at the Calcutta River Insurance Office.

19. Ditto, Ditto,

20. and 21. As the above.

22. Between the months of July and October Boats bound from the Ganges to Calcutta seldom come through the Sunderbunds; when they do, large Boats are not less than 15 days in traversing this passage, and small Boats not less than 10 days; from November to February 10 and 6 days for large and small Boats respectively, and from March to May not less than 25 days. Boats travelling from Calcutta to the Ganges perform the passage in 15 days between the months of February to June; and from July to October they seldom make this passage; from November to January it is performed in 20 days.

23. Higher wages and higher freight are, I am told, demanded from the causes enumerated, but their fears do not extend to the prevention of navigating Boats by that route. I cannot speak to the extent to which these

1822. Nov. 30th causes operate in raising the price of freight. This information seems to me more readily procurable from the Boat Office and Ghaut Mangies of Calcutta

24. My information does not enable me to answer this question.

25 I should suppose the adoption of Lieutenant Schalch's line of Canals will reduce the usual rate of Freight and Insurance considerably, but to what extent per cent. I cannot say.

26. Often 15 days in the months of April, May, June, and July.

27 Certainly, I should think.

28 The value of a Basin or Harbour of the description in question, with suitable Warehouses for the deposit of Goods, upon something of the Plan of the West India and other Docks of London, I think, may be very highly estimated both in view to forming a concentrated spot for the reception of the Inland Commerce of Calcutta, and in facilitating the means of collecting the Custom House dues of Government; it might be required that all Boats importing cargo should resort to it. I am not able to answer the latter part of this Query

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# G. 4. *b*.

List **No. 5.**

*On the Nature and Extent of the Trade under the influence of the Navigation to the Eastern and Western Provinces.*

1 and 2 Those of expedition, and quick and more profitable return of capital employed, reduced expenses in wages and freight, security from danger both of wild beasts and of the Navigation.

3. This question I am not able to answer with the accuracy desirable.

4 I am unable to answer this question; in the article of Salt however, 1,150 Boats amounting in the aggregate to the burthen of maunds nearly 660,000 lacks were in the past year (1821) employed by Salt Merchants, and the value of this Merchandize, cannot be estimated at less than Sicca Rupees twenty lacks; the size of the Boats were generally from 200 to 800 maunds employed through the year, performing the voyage chiefly through the route of the Sunderbunds, and destined mostly to the Provinces to the Eastward Very little Salt comes to the Presidency.

Barripore Salt Office, (*Signed*) R. C. PLOWDEN,
*The 20th November*, 1822 *Acting Agent.*

# G 5.

Dec. 28th. *The following Letter and Statements were received from the Collector of the 24-Pergunnahs.*

No. 10. To CAPTAIN R. C. FAITHFULL,

*Secretary to Special Committee for Reporting on Lieut. Schalch's Plans.*

SIR,

With reference to your Letter of the 28th October I have the honor to transmit two Statements, which will I trust, satisfactorily exhibit all the information required.

2 The difficulty of ascertaining, with any degree of correctness, the information herein furnished, will plead my excuse for not having sooner replied to your Letter.

I am Sir, &c. &c.

(*Signed*,) C. TROWER

*Collector.*

COLLECTOR'S CUTCHERRY,
24-PERGUNNAHS,
*The 14th December, 1822.*

# G 5, *a.*

*Statement exhibiting the Boats, &c. passed through Tolly's Nullah, together with the Tolls levied thereon, and the sums collected and remitted to the Treasury of the Collector of 24-Pergunnahs, in the last three years of account, viz. from*

No. 11. *1st May, 1819 to 30th April, 1822.*

| YEAR. | Total Boats and Dinghis passed thro' Tolly's Nullah. | Number of Boats [illegible] | Number of Boats [illegible] | Number of [illegible] Boats | Number of Boats [illegible] Passenger |
|---|---|---|---|---|---|
| From 1st May, 1821, to 30th April, 1822—or 1228, B. S. | 30,655 | 20,545 | 9,400 | 7,881 | 3,264 |
| From 1st May, 1820, to 30th April, 1821—or 1227, B. S. | 29,688 | 21,484 | 11,388 | [illegible] | 3,901 |
| From 1st May, 1819, to 30th April, 1820—or 1226, B. S. | 32,953 | 24,801 | 13,903 | 7,581 | 4,367 |

Petition of Comuliam Sircar and Obeychurn Bannerjea
Mis Rev Pro 13th June, 1837, No 6

24th The annexed Petition was referred to the Superintendent of Canal in order to be disposed of according to its merits

Lease of Lands on the Banks of the Circular Canal
Mi Rev Pro 20th June, 1837, Nos 5 and 6

25th At the recommendation of the Military Board, Lord Auckland authorized the lease of the Land on the Banks of the Circular Canal, for a period of 5 years.

Captain Thomson's Bill for Boat hire.
Mi Rev Pro 25th April 1837, No 3

26th On the annexed date, a Bill by Captain J Thomson for Boat hire, while employed in inspecting the Canals during the half-year, ending in December 1836, amounting to Rupees 138-1 7 was passed by Lord Auckland

Progress Report of the Iron Bridge Department
Mis Rev Pro. 2nd May, 1837, Nos 5 and 6

27th The annexed papers contain a Progress Report, ending the 31st December 1836 showing the work done in the Iron Bridge Department during that period

## No. LXVIII.

### *Extract—Letter from the Honorable the Court of Directors to the Governor General in Council, in the Revenue Department, dated the 9th March*, 1831, No. 8.

Court's reply to Letter of 23rd March 1830

Para 124 This letter transmits to us the Report from the Secretary of the Saugor Island Society presenting the History of the proceedings of the Society with an account of the present state of the operations on the Island, and the hopes which may be entertained of future success

125 The Report seems to be full and accurate in its information. The success though less than was hoped for, and sanguinely anticipated at the beginning is not such as to preclude the hope that the Island may be rendered valuable, and a source of abundant profit to those who embark in the enterprise of cultivating and peopling it

126 We have paid particular attention to that part of the Report which represents the importance of improving the communication of the Island with other parts either by continuing the road from Diamond Harbour to Channel Creek, or by a Canal to connect Calcutta with the lower Sunderbund passage

127 The advantages which it is stated would accrue from this latter work are so important, and to us appear so probable, that we think it demands your immediate and serious attention, so far at any rate as to obtain by enquiry the means of forming an accurate judgment of the benefit which may be expected from such a Canal and the cost at which it might be effected

128 We shall be happy to receive an early communication of your sentiments on this subject

## No. LXIX.

### *Extract—Letter from the Honorable the Court of Directors to the Government of Bengal, in the Revenue Department, dated the 25th September* 1835, No. 6.

(19 to 23) Propositions from the Saugor Island Society, Disinclination of the Mercantile community to open a communication between Calcutta and the lower Sunderbunds

Para 233 We regret that the anticipations with regard to this Society, and the prospects it appeared to hold out of ultimate success, have not been realized

# No. XLIX.

*Extract—Letter to the Honorable the Court of Directors, dated the 28th April, 1838.*

Canals
Reply to Court Letter on the subject of Eastern and Circular Canals
Mil. Rev. Pro. 9th May 1837 Nos. 3 to 5
" 12th Sept 1837 Nos 1 to 5

Para 14th With reference to your Honorable Court's Letter, No. 2 of 1837, on the subject of the Eastern and Circular Canals the Military Board were called upon to furnish a Report upon the following points.

The fitness of the Lock at Chitpore for the object of its construction

The means employed to remove the silt deposited in the Canal by the Calcutta Drains and the expence incurred on that account during the last three years.

The average number of Boats which pass the Canal daily, and the number which can pass in a day

Whether the consequences apprehended by Col Galloway from the mingling of the waters of the Lake and the River have been felt, and if so, in what degree, and with what effect

15th From the Report of the Military Board (accompanying), your Honorable Court will learn that the Lock at Chitpore has fully answered the end of its construction

16th The average number of Boats which pass the Canal daily is not stated, but 130 Boats have passed through, and with increased facilities, it is supposed that 250 might be locked through in a day.

17th. The admission of the River current into the Canal has been resorted to as a means for removing the silt deposited in the Canals and is stated by the Board to have had considerable influence along the whole "line."

18th The construction of a Cess-Pool at the head of the Entally Canal, has also had the effect of retaining within it a large body of silt flowing into from the City Drains

19th With the view of securing the efficient dredging of these Canals the construction of an Iron Dredging Boat, as was reported to your Honorable Court in Lord Auckland's letter No 22, of the 19th September 1837, para 11, was authorized

20th The expence which has been incurred in dredging these Canals for the last 3 years, is stated to be Rupees 24,646-10-4

21st It will be satisfactory to your Honorable Court to learn, that the wholesomeness of the water of the Hooghly has in no way been effected by the Salt-water of the Canal. The Military Board state, that "the relative levels of the River and the Lake show that the true "ground of apprehension should have been, not that the River would become salt, but that "the Lake would become fresh."

22nd In the letter of the 19th September, just quoted, a full report has been submitted of the measures which have been authorized for the improvement of these Canals, and of the very favourable issue of the lowering of the rates of Toll on these Canals. The Military Board, in a Report which is still under consideration, advocate a still further reduction, and have submitted a still more favourable Report of the management of these Canals for the six months ending the 31st October 1837.

23rd These papers should have accompanied the letter No. 22 of 1837. The decision of Government on the application of the Military Orph Society was made known to your Honorable Court in

The Military Orphan Society's objections against the new rate of Toll
Mil. Rev Pro 16th May, 1837, Nos 17 to 20

234. It appears by the proceedings now reported, that the Society, after having expended in clearing and cultivation the sum of ten lacs of Rupees, have wholly failed in their object. this they attribute among other causes to the competition created by the recent grants of Sunderbund Lands (generally more favourably* situated). They therefore submitted the following requests :—

* The Sunderbund Grantees hold their Lands free for 20 years, then at a Jum ... increasing for the next four years from 2 to 8 annas Per Beegah, and for the 25th year at the latter rent in perpetuity. The Society obtained their land free for 30 years, and then in perpetuity at 4 annas per Beegah. (p. 17.)

1st. An immediate division of the Island among the Shareholders.

2nd. An extension of the term for which the lands were to be held rent free.

3rd. A reduction in the number of Trustees.

235. The question having been referred to the Advocate General, he gave it as his opinion, that the Society having failed to perform certain conditions of the Deed, the grant itself was virtually void, and the Society in consequence dissolved ; and that your Government, after issuing the prescribed notices, might resume the whole of the uncleared and uncultivated Lands. The Society were accordingly informed that in consequence of their inability to execute their undertaking, it had become necessary to make a new grant of the Island to the several individuals who had already exerted themselves in bringing it into cultivation or were prepared to do so.

236. Your proceedings do not bring the matter beyond this point, nor have we any further advice from you on the subject.

237. We must again express our regret that your repeated efforts to induce the Mercantile community to open a water communication between Calcutta and the lower Sunderbunds were unsuccessful, whilst we concur in opinion that the employment of Steam Boats in the navigation of the Hooghly, and the opening of the Eastern Circular Canal, render the object of less importance than it formerly was.

(True Extract.)

H. TURNBULL,

*Under Secretary to Government of Bengal.*

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## No. LXX.

No. 2053.

To C. BEADON, ESQ.,

*Under-Secretary to the Government of Bengal.*

SIR,

I have the honor to acknowledge the receipt of your letter No. 578, of date the 16th instant, and its enclosures, and with advertence to the 237th paragraph noted on the margin* of the Honorable Court of Director's letter, in the Revenue Department, of date the 25th September, 1835, No. 6, I am directed by the Honorable Sir J. P. Grant to request you to furnish him at your earliest convenience, for the use of the Municipal Committee, with Extracts of those Dispatches of the Government of Bengal, together with th Original Papers referred to in those Extracts, wherein Government inform the Court of their repeated efforts to induce the Mercantile com to open a water communication between Calcutta and the lower Soonderbuns (refe Committee suppose, to Major Schalch's proposed Canal to Channel Creek)

* 237. We must again express our regret that your repeated efforts to induce the mercantile community to open a water communication between Calcutta and the lower Sunderbuns, were unsuccessful, whilst we concur in opinion that the employment of Steam Boats in the Navigation of the Hooghly and the opening of the Eastern Circular Canal, render the object of less importance than it formerly was.

unsuccessful; and Extracts of the several Dispatches of the Court, wherein they express their regret that they have been so.

The Committee also are desirous of knowing if the request of the Saugor Island Society, referred to in the 234th paragraph of the Court's Dispatch above cited, were complied with, or a new grant made of the Island to the several individuals who already had exerted themselves in bringing it into cultivation, or were prepared to do so; and what are the circumstances at present of that Island in respect to its tenure, occupation, cultivation, and clearing.

I have the honor to be,
Sir,
Your most obedient Servant,
(Signed) J. MORRIS,
*Clerk to the Committee.*

MUNICIPAL OFFICE, TOWN HALL:
*25th July*, 1845.

NOTE.—With reference to the above communication, the Committee were favoured with the Papers, marked No. XLII½ and No. XLVII¼ in this Appendix.—J. M.

BISHOP'S COLLEGE PRESS.